

EPA Region 5 Records Ctr.



202465

1995
STATE RESPONSE

DOCUMENTS 1-22

KALAMAZOO RIVER

SITE

INVESTIGATION

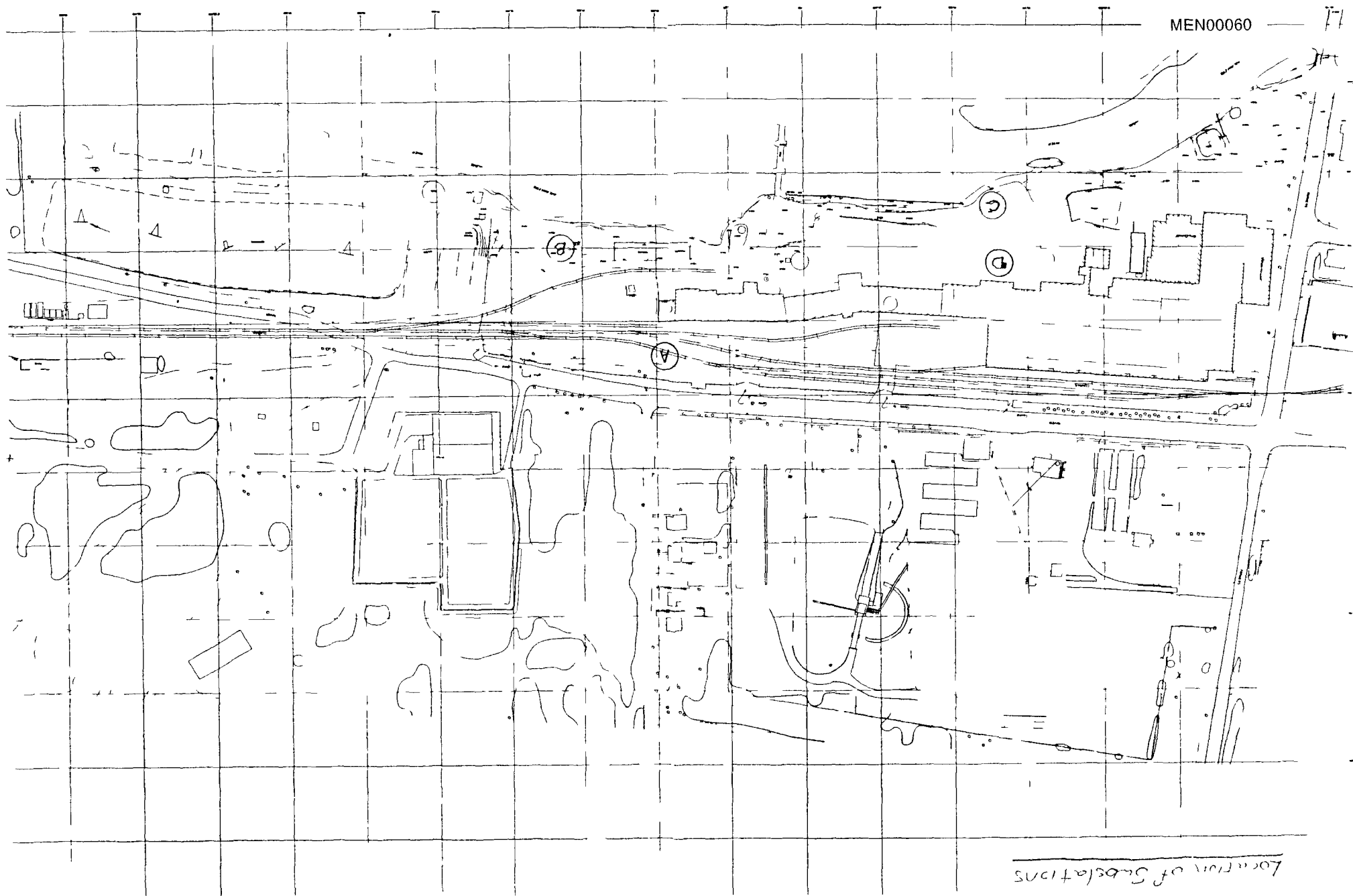
DOCUMENTS #1 - 22

LOCATION OF SUBSTATIONS

DOCUMENT #1

MEN00060

17



UST GASOLINE TANKS REMOVAL REPORT

DOCUMENT #2

memo / **WILMINGTON**
CORPORATION

TO: John Blauwkamp

DATE: August 27, 1986

SUBJECT: Gasoline Tank Removal

FROM: Gary Roys
(GR)

On Friday, June 6, 1986, the 1000 gallon and 550 gallon tanks used to hold unleaded, and lead gasoline were dug up and removed. These tanks were located off of Farmer St. next to the existing garage. The tanks were emptied by Ridderman and Sons, and dug up and removed by Cushman Construction. After emptying the tanks, dry ice (solid carbon dioxide), one (1) cubic foot, was added to each tank. They were then dug up. After each tank was lifted from the hole, they were inspected for leaks and photographs taken. No leaks were observed in either tank. Further, soil underneath each tank was examined and the odor of the soil was observed. In both cases no detectable gasoline odor was noted. Soil samples were also taken for VOC testing and sealed in mason jars. The tanks were hauled away by Cushman Construction who purchased these tanks (see attached receipt).

VOC analysis done by Prein & Newhof were negative for the soil samples (see attached sheet).

cc: John Bonham

Attachment

kj

Cushman Estimates
550 gal TANK - \$ 510
1000 gal TANK - \$ 710

NO. _____

June 6 1986

(~~Mr.~~) *Ray's*

MEN00063

RECEIVED FROM Cushman Construction

Twenty and 00/100 DOLLARS

(1) 1,000 gallon and (1) 550 gallon underground type tanks

Account Total \$ 20.00

Amount Paid \$ 20.00

Balance Due \$ 0

For 2011, 2012, and

"THE EFFICIENCY LINE" AN AMPAD PRODUCT



PREIN & NEWHOF, P.C.
ENGINEERS — SURVEYORS
ENVIRONMENTAL & SOILS LABORATORIES
3000 EAST BELT LINE N.E., GRAND RAPIDS, MICHIGAN 49505
285 JAMES STREET, SUITE E, HOLLAND, MICHIGAN 49423

MEN00064

TELEPHONE (616) 364-8491
TELEPHONE (616) 399-9218

H. EDWARD PREIN P.E., R.L.S.
THOMAS NEWHOF P.E.
WILSON D. McQUEEN P.E.
LARRY D. WILSON P.E.
MICHAEL S. FULLER P.E.
PHILIP C. GLUPKER P.E.
JAMES A. COOK P.E.
ROBERT J. VANDER MALE P.E.
ROBERT J. REIMINK P.E.
RICHARD L. SERBOWICZ P.E.
ARTHUR W. BRINTNALL R.L.S.
REX A. MILLIRON R.L.S.

July 22, 1986
77129

Mr. Mark Reed
Menasha Corporation
P O Box 155
Otsego, Michigan 49078

RE: Soil samples received 6/10/86
Labelled "1000 gal" and "550 gal"
To be tested for gasoline

LABORATORY RESULTS

<u>Parameter</u>	<u>Sample #</u>	
	<u>1000 gal Tank</u>	<u>550 gal Tank</u>
Benzene, ug/L	<1	<1
Toluene, ug/L	<1	<1
Ethylbenzene, ug/L	<1	<1
Xylenes, ug/L	<1	<1

PREIN & NEWHOF

Jane Hoch
Jane Hoch
Chemist

Lab Log #756,757
JH:sa

UST DIESEL TANK REMOVAL REPORT

DOCUMENT #3

MTI Tank Closure
Otsego, Michigan
November, 1987

The closure work, including tank removal and soil excavation, at the Otsego mill site was completed November 20, 23, and 24. The removed 12,000 gallon tank was operated by Menasha Transport out of Neenah, Wisconsin. The removal was in accordance with Purchase Order #805355.

The tank, which was abandoned by excavation and removal, has a volume of approximately 12,000 gallons. The tank was located in the northwest section of Menasha's property in Otsego in the southwest corner of the chipyard. Map 1 depicts the tanks location in relation to the buildings in the chipyard. The tanks were introduced approximately 12 years ago and of black coated steel. The tank stored diesel fuel for use by MTI.

Prior to site closure, a copy of the general specifications for abandonment of underground tanks was submitted to A.P.E.C. of Mattawan, Michigan ([616]343-0000). Therefore, before A.P.E.C.'s arrival on-site, it was Menasha's understanding that the specifications had been read. A copy of the general specifications is attached to this report.

Prior to arrival on site by A.P.E.C., the gas company and water company marked the lines between Farmer Street and the chipyard building. The power and electrical hook-ups for the semi-trailers were disconnected by Menasha personnel prior to excavation.

The crew arrived at Menasha by 9:30 a.m. on Friday, November 20, 1987. The weather was cold and snowy, with intermittent sunshine through the overcast sky.

Photographs 1 through 48 illustrate the closure process for the underground tank. Photographs 1 through 5 show the construction of a berm lined with an impermeable membrane, to be used for storage of contaminated soils. The berm was constructed west of the tank location and chipyard house. An additional area for contaminated soil was constructed on the north edge of the tank. Photographs 6 through 8 depict the removal of the remaining fuel from the underground tank to the tanker truck. Approximately 456 gallons of both sludge and usable fuel was transferred. The pumped fuel was added to the top of the intermediate liquor tank at the tank farm on Menasha's property. Photographs 9 and 10 show the line from which fuel was pumped from the tanker to the farm.

The old pump from the tank was completely dismantled. Photograph 11 shows the former location of the pump.

Page 2

The backhoe operator then excavated the surface materials to the south of the tank along the length of it (Photograph 12). During excavation soil samples were inspected visually and through olfaction. The backhoe operator continued to expose the south side of the tank to the base of the tank (Photographs 13 through 15). Photograph 16 depicts the bottom edge of the tank on the south side.

The dark soils towards the surface in Photograph 17 contain some concentration of fuel oil. Samples analyzed from the surface of the southeast end showed 20 - 40 ppm of fuel in the soil. Contaminated soils were only found near the surface. Clean soils were experienced towards the lower half of the tank. The surface down to the dark layer in Photograph 18 contains some level of fuel.

All suspected contaminated soils were placed on visquine in the bermed area. Soils along the base of the tank (Photograph 20) were tested by Paul Lassoth of the MDNR and deemed clean.

The area around the hole was blocked off with yellow CAUTION tape (Photograph 21) and later that evening, circled with a snow fence (Photograph 22 and 23). The lights on the backhoe were left flashing to warn anyone in the area.

The soils on the north pile were covered and the edges cured to prevent leaking of contaminants further into the area (Photograph 24). Paul also determined some of the soils on the west visquine and the pile west of that were acceptable for placement back in the hole (Photograph 25).

The crew returned Monday, November 23. Clean soils on the west storage pile were removed so that the bermed area could be further used for any contaminated soils found (Photographs 26 - 28).

At 10 a.m. the remainder of the tank excavation began. Photograph 29 of the west end of the tank shows early stage of tank deterioration in exposure of bare steel along the edge and rusting. A chain was placed through the old fill pipe and vent pipe holes on the west end of the tank (Photograph 30). The tank was determined to be of sound construction in order to lift it in this manner (Photographs 31 and 32). There was no apparent moisture around the base of the tank before lifting, therefore suction was not a significant factor. During lifting it was noted that the tank has a moisture line only along the bottom base of the tank that had remained in the ground over the weekend (Photograph 33). This is most likely due to weather conditions or soil moisture rather than groundwater influences.

Page 3

By rolling the tank to the south from the hole, only one side of the tank required excavation or background materials. Care was taken by the operator to assure it did not roll completely over, therefore preventing any remaining sludge in the bottom of the tank from spilling onto the ground (Photographs 34 - 37).

Paul Nassoth, Michigan DNR, noted fuel oil in the first two and one-half feet (Photograph 38, Part 1) and approximately 1 - 2 ppm in Part 2 of Photograph 38. There was no discernible odor at the east end of the hole only the west end. Paul agreed to allow Menasha to leave this material in place until the summer at which time the whole area will require surface excavation.

All contaminated soil in this area was due not to a leaking underground storage tank but rather due to improper fueling practices by MTI operators. During site restoration the summer of 1988, MTI will be expected to assist in cleanup costs.

Photograph 39 depicts the soils beneath the removed tank (looking west).

Photographs 40 through 44 show the process of loading the tank onto the trailer. The removed tank had a diameter of nine feet and a length of 25.4 feet. Once on the trailer, the tank was bunkered and chained to prevent any movement during transport to A.P.E.C. site. The tank and trailer were stored to the east of the chipyard house until removed (Photograph 45).

Four loads of fill were brought from Menasha's property. The smaller backhoe was used to push the fill material into the hole. The site was once again fenced off with an orange snow fence and yellow CAUTION tape at the end of the day (Photograph 46). The lights on the backhoe were left flashing until the crew returned the following morning (Photograph 47).

The crew arrived at 9 a.m. Tuesday morning. The remaining four loads of fill for the hole were brought in from Smith's. The site was filled and regraded using the backhoe (Photographs 48 and 49). The site was not periodically compacted, therefore settling should be expected. The surface was not sodded or seeded due to the reworking of this area in the summer.

All contaminated soils (100 cubic yards) were taken to the Westside Landfill in Three Rivers, Michigan. The letter for disposal approval and a dump slip are included in the Appendix.

The tank was hauled to A.P.E.C.'s site for cleaning and cutting. A.P.E.C. has a bermed area with an impermeable liner which they use for placement of the tank during cleaning. The tank was cleaned, cut up, and disposed of at a local scrap yard.

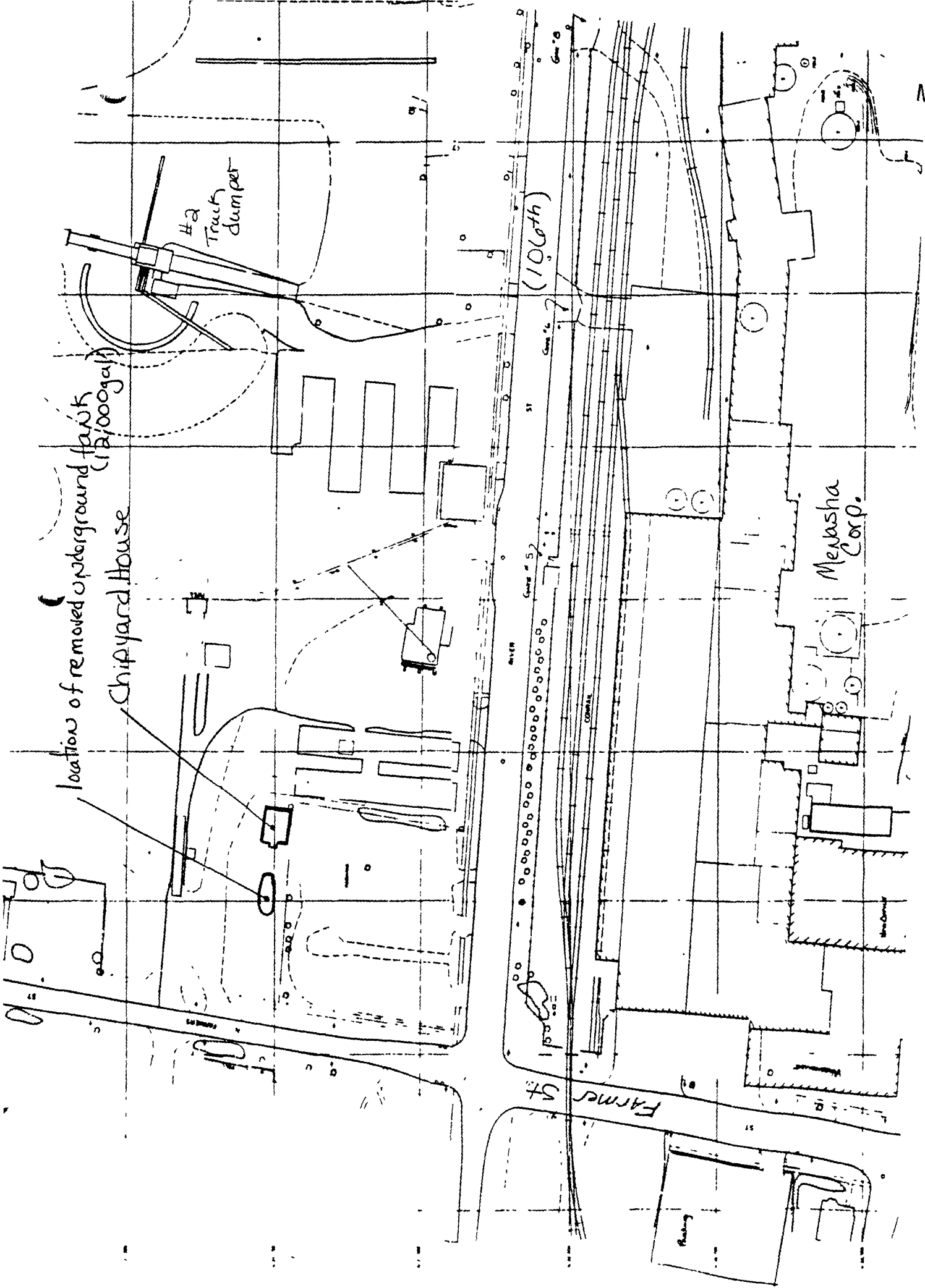
Page 4

Once the tank left the Menasha facility, A.P.E.C. became owner of the tank.

SJ/jj

NTITANK.CLO

cc/ Lyle Zulegar
Keith Kling





TO: John Blauwkamp - Otsego

DATE: November 11, 1987

SUBJECT: UNDERGROUND TANK OTSEGO

FROM: Lyle Zuleger

cc: Ed Fetzer

Arens Equipment is ready to remove the tank in Otsego. I gave them your name and number to work out some details. The two items in question on the quote - removal of contaminated soil and sludge in the tank will be handled as follows:

1. Contaminated soil - taken to a Type II dump site in Grand Rapids for \$35.00 per yard.
2. Sludge in tank - taken to a disposal sight in Detroit for .45 per gallon plus \$115.00 per hour trucking cost with a maximum of 10 hours. Proper documentation of disposal will be provided by hauler.

The cost for tank removal, sludge disposal and tank disposal and all documentation should run \$4,285.00. The soil would be extra as I stated. Please let me know if this meets with your approval so I can request an E. A. and P. O. for the project.

Lyle Zuleger
LZ:ph

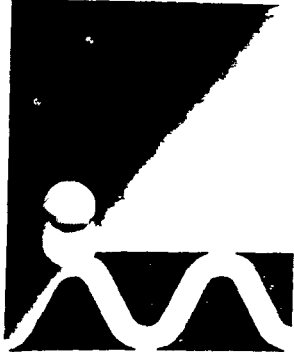
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This proposal is acceptable.

Pl. issue the P.O.

JB

11/16/87



MENASHA CORPORATION

PAPERBOARD GROUP

November 24, 1987

Westside Landfill
Three Rivers, MI. 49093

Dear Sirs:

At the request of the Michigan Department of Natural Resources, contaminated soil from an underground tank removal requires proper disposal at a approved disposal site. The tank from the property of the Menasha Corporations Otsego Mill, contained diesel fuel. The removal of the tank and associated soils was completed by the A.P.E.C. of Kalamazoo who have the consent to haul less than 100 yards of fuel contaminated soil to the Westside Landfill if acceptable.

Thank you for your cooperation.

Sincerely,

A handwritten signature in dark ink that reads "Sandra Jones". The signature is written in a cursive, flowing style.

Sandra Jones
Corporate Environmental Engineer

/ac



MENASHA CORPORATION

PAPERBOARD GROUP

March 9, 1989

Chris Canigleo
Westside Landfill
P.O. Box 350
Three Rivers, MI. 49093

Dear Chris,

A typographical error was made on the letter I sent to you on March 6, 1989. On the third line it states that material was disposed of at "our" facility. It should have read "your" facility. To avoid major concerns about this in future years, please note this correction on your copy.

Sincerely,

Otsego Paperboard Division

Keith Kling
Environmental Supervisor

cc: Michigan Disposal
Mike denOtter
John Bonham
John Blauwkamp
Sandra Hoffbeck

/ac



MENASHA CORPORATION

PAPERBOARD GROUP

Chris Canigleo
Westside Landfill
P.O. Box 350
Three Rivers, MI. 49093

March 6, 1989

Dear Chris:

In November of 1987 Menasha Corporation of Otsego took out an underground tank. The surrounding soil was contaminated with diesel fuel and was disposed of at our facility (see attached letter). We are now making a final cleanup of this area and wish to bring the rest of this material to your landfill. The material in question consists of fuel contaminated sand and gravel as well as concrete and wood from a demolished building at this site. A small amount of oil dry used to soak up clean hydraulic oil would also be included. There will be approximately 50 yards in total.

All of the above listed material is considered to be non-hazardous. Upon your approval I will contact Michigan Disposal who will transport it to your site.

Sincerely,

Otsego Paperboard Division

Keith B. Kling
✓ Keith B. Kling
Environmental Supervisor

Enclosure

cc: Michigan Disposal
Mike denOtter
John Bonham
John Blauwkamp
Sandra Hoffbeck

/ac



August 29, 1989

Mr. Keith Kling
Menasha Corporation
320 North Farmer Street
Otsego, Michigan 49078

Dear Mr. Kling:

Pursuant to our recent telephone conversations, STS has developed a cost estimate for monitoring of soil removal at the Otsego Paper Board Plant. This work will be performed in the area of former diesel fuel station.

In 1987, STS attempted to perform hand auger borings in this area to estimate the presence and extent of any petroleum products. Due to the presence of gravel and compacted soil, STS could only advance three (3) borings between 2.0 and 4.5 feet. The soil samples collected were scanned with an HNU Systems, Inc. photo-ionization detector (PID) to evaluate for the presence of volatile organic compounds. Positive response were recorded on the PID to a depth of 4.5 feet. As only 3 hand auger borings were performed to only shallow depths, STS cannot accurately estimate the volume for excavation.

During excavation, STS will supply field personnel to monitor excavation soil with the PID meter and aid in collection of soil samples for chemical laboratory analysis. Presently, we estimate two days of field work for one person will be required to complete the soil excavation. In addition, four (4) soil samples will be collected at completion of excavation, to be analyzed for benzene, toluene, ethyl benzene, total xylene (BTEX), and total petroleum hydrocarbon by gas chromatography. Upon completion of the soil removal monitoring, STS will submit a brief letter report summarizing the field monitoring and chemical analysis. Table 1 presents a summary of the estimated costs.

Table 1
Cost Estimate for Soil Monitoring

On-site monitoring (2 days on-site)	\$1,530.00
Chemical Analysis (4 soil samples for BTEX and total petroleum hydrocarbon)	850.00
Letter Report	800.00
Project Management	400.00
Subtotal	\$3,580.00
Insurance Liability Surcharge (7.0%)	250.00
Total	\$3,830.00

STS Consultants Ltd.
Consulting Engineers

3340 Ranger Road
Lansing, Michigan 48906
517.321.4964/Fax 517.321.2132

Mr. Keith Kling
Menasha Corporation
August 29, 1989
Page 2

MEN00076

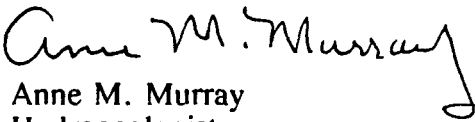
The cost estimate quoted above represents our best estimate of the effort involved. Our services for the above scope of work will be invoiced monthly, with payment due upon receipt at the standard rates shown on the Fee Schedule presented in the appendix. A cost estimate of \$3,850.00 has been established for this project, on a time and materials basis. An insurance surcharge of 7.0% has been added to the cost estimate to cover work of this nature. If other items are required because of unexpected field conditions, or because of requests for additional services, these would be invoiced in accordance with the attached Fee Schedule. For modifying or expanding the extent of the work scope, Menasha Corporation would first be informed of our intentions. Review and authorization would be requested prior to proceeding with additional services.

Pursuant to the STS master contract, your acceptance of our proposal confirms that the terms and conditions are understood, including payment to STS Consultants, Ltd. upon receipt of the invoice, unless specifically arranged otherwise in writing. If we are given verbal notification to proceed without first receiving a signed copy of this proposal, it will be mutually understood that both of us will, nonetheless, be contractually bound by this proposal, even in the absence of written acceptance by you.

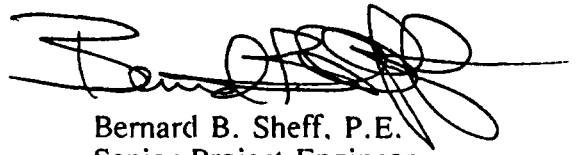
If you have any questions concerning this work, please contact us at (517) 321-4964.

Sincerely,

STS CONSULTANTS, LTD.


Anne M. Murray
Hydrogeologist

AMM/kjl AMM6 14


Bernard B. Sheff, P.E.
Senior Project Engineer
Area Manager

ACCEPTED BY:

Firm _____

Signature _____

Title _____

Date _____

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MENASHA CORPORATION

PAPERBOARD GROUP

Mr. Chris Canigleo
Westside Landfill
P.O. Box 350
Three Rivers, MI. 49093

September 1, 1989

Dear Chris:

Menasha Corporation is presently undertaking further clean up of soils around some of our equipment at the mill. The first area of concern involves clean sand and gravel contaminated with diesel fuel. In March of this year, we did part of this clean up bringing about 50 yards of material to your facility. It is our intention to complete cleaning of this area at this time, by removing all contaminated soils down to the level of detection with an HNu meter. Depending on the meter readings, we could be removing anywhere from 400-1000 yards of material.

The second clean up area involves soils around our #2 truck dumper. This soil has been contaminated with Mobil DTE 13 hydraulic oil. Tests show the levels of oil in the soil run from 13 ppm to 22,000 ppm. Because there are buildings in this area, the amount of soil to be removed has not been determined yet, however it will be several hundred yards. I have included MSDS sheets for both the diesel fuel and the hydraulic oil.

All of the above listed materials are considered to be non-hazardous.

Upon your approval, I will begin the diesel fuel project immediately, with the hydraulic oil project scheduled near the end of September.

Sincerely,

Otsego Paperboard Division

Keith B. Kling
Environmental Supervisor

cc: John Bonham
Ron Thaxton

Mike denOtter
John Blauwkamp

Jay Thiessen

KBK:amc

**MATERIAL SAFETY
DATA SHEET**

AMOCO NO. 1 FUEL OIL

MEN00078

MANUFACTURER:
Amoco Oil Company
200 East Randolph Drive
Chicago, Illinois 60601

EMERGENCY HEALTH INFORMATION: (800) 447-8735
EMERGENCY SPILL INFORMATION: (800) 424-9300
OTHER PRODUCT SAFETY INFORMATION: (312) 856-3907

IMPORTANT COMPONENTS: Petroleum distillate.

WARNING STATEMENT: Warning! Combustible. Harmful or fatal if swallowed and/or aspirated into lungs. Can cause skin irritation upon prolonged or repeated contact.

APPEARANCE AND ODOR: Clear, bright liquid.

HEALTH HAZARD INFORMATION

EYE

EFFECT: No significant irritation expected.

FIRST AID: Flush eyes with plenty of water.

PROTECTION: None required; however, use of safety glasses is good industrial practice.

SKIN

EFFECT: Can cause skin irritation on prolonged or repeated contact. See Toxicology Section.

FIRST AID: Wash exposed skin with soap and water. Remove contaminated clothing, including shoes, and thoroughly clean and dry before reuse.

PROTECTION: Wear protective clothing and gloves if prolonged or repeated contact is likely. Avoid prolonged or repeated skin contact.

INHALATION

EFFECT: None expected under normal conditions of use. See Toxicology Section.

FIRST AID: None required.

PROTECTION: None required for normal conditions of use. Use with adequate ventilation.

INGESTION

EFFECT: Low viscosity product. Harmful or fatal if swallowed and/or aspirated into lungs.

FIRST AID: If swallowed, do NOT induce vomiting. Get immediate medical attention.

FIRE AND EXPLOSION INFORMATION

FLASHPOINT: 110°F, (TCC) Minimum

FLAMMABLE LIMITS: UPPER: 6% LOWER: 1.3%

EXTINGUISHING MEDIA: Agents approved for Class B hazards (e.g., dry chemical, carbon dioxide, halogenated agents, foam, steam) or water fog.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Combustible liquid.

PRECAUTIONS: Keep away from ignition sources (e.g., heat and open flames).

REACTIVITY INFORMATION

STABILITY: Stable.

CHEMICAL AND PHYSICAL PROPERTIES

BOILING POINT: 300°F TO 580°F, Range

SOLUBILITY IN WATER: Negligible, below 0.1%

SPECIFIC GRAVITY (WATER = 1): 0.81 TO 0.85

VISCOSITY: 1.4-2.2 CS @ 100°F.

STORAGE AND ENVIRONMENTAL PROTECTION

STORAGE REQUIREMENTS: Store in combustible liquids storage area.

SPIILLS AND LEAKS: Remove or shut off all sources of ignition. Use water spray to disperse vapors. Treat as an oil spill. Contain and remove by mechanical means.

WASTE DISPOSAL: Enclosed-controlled incineration is recommended unless directed otherwise by applicable ordinances.

SPECIAL PRECAUTIONS: Avoid strong oxidizers.

TOXICOLOGICAL INFORMATION

EYE: Primary irritation scores for similar materials have ranged from 0.0 to 1.0/110.0 (rabbits).

SKIN: Similar products have produced primary skin irritation scores ranging from 0.67 to 6.1/8.0 (rabbits). Dermal LD50 for similar materials was greater than 2 g/kg (rabbits).

INHALATION: LC50 for a similar material was greater than 10.27 g/m3 (rats).

INGESTION: Oral LD50 for similar materials was greater than 5 g/kg (rats).

From skin-painting studies of petroleum distillates of similar composition and distillate range, it has been shown that these types of materials often possess weak carcinogenic activity in laboratory animals. Therefore, there may be a potential risk of skin cancer from prolonged or repeated skin contact with this product in the absence of good personal hygiene. This particular product has not been tested for carcinogenic activity, but we have chosen to be cautious in light of the findings with other distillate streams.

Occasional skin contact with this product is not expected to have serious effects, but good personal hygiene should be practiced and repeated skin contact avoided. This product can also be expected to produce skin irritation upon prolonged or repeated skin contact. Personal hygiene measures taken to prevent skin irritation are expected to be adequate to prevent risk of skin cancer.

Materials of this type have been shown to produce kidney damage in male rats following prolonged inhalation exposures. These kidney effects are very similar, if not identical, to those produced by various petroleum naphthas and gasoline blends. The significance of these findings in terms of human health is uncertain since the male rat appears uniquely prone to kidney damage following exposures to a variety of hydrocarbon materials. The American Petroleum Institute is presently conducting an intensive research program to determine the relevance, if any, of the kidney damage in male rats to human health. Although we do not believe these materials pose a serious human health risk, until additional information is obtained we recommend that users be cautious and avoid prolonged breathing of vapors.

REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: Combustible liquid.

DOT PROPER SHIPPING NAME (BULK, LAND): Fuel Oil, Diesel, Combustible Liquid, UN1993.

ISSUE INFORMATION

BY:



Stephen A. Elbert
Mgr., Product Safety & Toxicology

ISSUED: January 17, 1986
SUPERSEDES: April 29, 1985

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either express or implied.

MOBIL OIL CORPORATION MATERIAL SAFETY DATA BULLETIN

***** I. PRODUCT IDENTIFICATION *****
MOBIL DTE 13

SUPPLIER: MOBIL OIL CORP. HEALTH EMERGENCY TELEPHONE: (212) 383-4411
CHEMICAL NAMES AND SYNONYMS: PET. HYDROCARBONS AND ADDITIVES TRANSPORT EMERGENCY TELEPHONE: (800) 424-9300 (CHEMTREC)
USE OR DESCRIPTION: HYDRAULIC OIL

***** II. TYPICAL CHEMICAL AND PHYSICAL PROPERTIES *****

APPEARANCE: AMBER LIQUID ODOR: MILD PH: NA
VISCOSITY AT 100 F, SUS: 150.0 AT 40 C, CS: 29.6
VISCOSITY AT 210 F, SUS: 46.5 AT 100 C, CS: 6.0
FLASH POINT F(C): >330(166) (ASTM D-92)
MELTING POINT F(C): NA POUR POINT F(C): -40(-40)
BOILING POINT F(C): > 600(316)
RELATIVE DENSITY, 15/4 C: 0.882 SOLUBILITY IN WATER: NEGLIGIBLE
VAPOR PRESSURE-MM HG 20C: < .1

NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES
FOR FURTHER INFORMATION, CONTACT YOUR LOCAL MARKETING OFFICE.

***** III. INGREDIENTS *****

	WT PCT	EXPOSURE LIMITS	SOURCES
	(APPROX)	MG/M3	PPM (AND NOTES)
HAZARDOUS INGREDIENTS:			
NONE			

OTHER INGREDIENTS:
REFINED MINERAL OILS >90
ADDITIVES AND/OR OTHER INGREDIENTS. <10

KEY TO SOURCES: A=ACGIH-TLV, A*=SUGGESTED-TLV, M=MOBIL, O=OSHA
NOTE: LIMITS SHOWN FOR GUIDANCE ONLY. FOLLOW APPLICABLE REGULATIONS.

***** IV. HEALTH HAZARD DATA *****

EFFECTS OF OVEREXPOSURE: SLIGHT SKIN IRRITATION.

***** V. EMERGENCY AND FIRST AID PROCEDURES *****

EYE CONTACT: FLUSH WITH WATER.
SKIN CONTACT: WASH CONTACT AREAS WITH SOAP AND WATER.
INHALATION: NOT EXPECTED TO BE A PROBLEM.
INGESTION: NOT EXPECTED TO BE A PROBLEM. HOWEVER, IF GREATER THAN 1/2 LITER(PINT) INGESTED, IMMEDIATELY GIVE 1 TO 2 GLASSES OF WATER AND CALL A PHYSICIAN, HOSPITAL EMERGENCY ROOM OR POISON CONTROL CENTER FOR ASSISTANCE. DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

***** VI. FIRE AND EXPLOSION HAZARD DATA *****
FLASH POINT F(C): > 330(166) (ASTM D-92)
FLAMMABLE LIMITS. LEL: .6 UEL: 7.0
EXTINGUISHING MEDIA: CARBON DIOXIDE, FOAM, DRY CHEMICAL AND WATER FOG.
SPECIAL FIRE FIGHTING PROCEDURES: FIREFIGHTERS MUST USE SELF-CONTAINED
BREATHING APPARATUS.
UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

***** VII. REACTIVITY DATA *****
STABILITY (THERMAL, LIGHT, ETC.): STABLE
CONDITIONS TO AVOID: EXTREME HEAT
INCOMPATIBILITY (MATERIALS TO AVOID): STRONG OXIDIZERS
HAZARDOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE.
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

***** VIII. SPILL OR LEAK PROCEDURE *****
ENVIRONMENTAL IMPACT: REPORT SPILLS AS REQUIRED TO APPROPRIATE
AUTHORITIES. U. S. COAST GUARD REGULATIONS REQUIRE IMMEDIATE
REPORTING OF SPILLS THAT COULD REACH ANY WATERWAY INCLUDING
INTERMITTENT DRY CREEKS. REPORT SPILL TO COAST GUARD TOLL FREE
NUMBER 800-424-8802.
PROCEDURES IF MATERIAL IS RELEASED OR SPILLED: ADSORB ON FIRE RETARDANT
TREATED SAWDUST, DIATOMACEOUS EARTH, ETC. SHOVEL UP AND DISPOSE OF
AT AN APPROPRIATE WASTE DISPOSAL FACILITY IN ACCORDANCE WITH
CURRENT APPLICABLE LAWS AND REGULATIONS, AND PRODUCT
CHARACTERISTICS AT TIME OF DISPOSAL.
WASTE MANAGEMENT: DISPOSE OF WASTE BY SUPERVISED INCINERATION IN
COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS.

***** IX. SPECIAL PROTECTION INFORMATION *****
EYE PROTECTION: NO SPECIAL EQUIPMENT REQUIRED.
SKIN PROTECTION: NO SPECIAL EQUIPMENT REQUIRED. HOWEVER, GOOD PERSONAL
HYGIENE PRACTICES SHOULD ALWAYS BE FOLLOWED.
RESPIRATORY PROTECTION: NO SPECIAL REQUIREMENTS UNDER ORDINARY
CONDITIONS OF USE AND WITH ADEQUATE VENTILATION.
VENTILATION: NO SPECIAL REQUIREMENTS UNDER ORDINARY CONDITIONS OF USE
AND WITH ADEQUATE VENTILATION.

***** X. SPECIAL PRECAUTIONS *****
HANDLING: NO SPECIAL PRECAUTIONS REQUIRED.

***** XI. TOXICOLOGICAL DATA *****
---ACUTE---
ORAL TOXICITY (RATS): SLIGHTLY TOXIC(ESTIMATED) ---BASED ON TESTING OF
SIMILAR PRODUCTS AND/OR THE COMPONENTS.
DERMAL TOXICITY (RABBITS): SLIGHTLY TOXIC(ESTIMATED) ---BASED ON
TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.
INHALATION TOXICITY (RATS): NOT APPLICABLE ---HARMFUL CONCENTRATIONS OF
MISTS AND/OR VAPORS ARE UNLIKELY TO BE ENCOUNTERED THROUGH ANY
CUSTOMARY OR REASONABLY FORESEEABLE HANDLING, USE, OR MISUSE OF
THIS PRODUCT.
EYE IRRITATION (RABBITS): EXPECTED TO BE NON-IRRITATING. ---BASED ON
TESTING OF SIMILAR PRODUCTS AND/OR THE COMPONENTS.
SKIN IRRITATION (RABBITS): MAY CAUSE SLIGHT IRRITATION ON PROLONGED OR
REPEATED CONTACT. ---BASED ON TESTING OF SIMILAR PRODUCTS AND/OR
THE COMPONENTS.

***** XII. REGULATORY INFORMATION *****
TSCA INVENTORY STATUS: ALL COMPONENTS ARE REGISTERED.
EINECS INVENTORY STATUS: ALL COMPONENTS ARE REGISTERED.
THE FOLLOWING PRODUCT INGREDIENTS ARE CITED ON THE LISTS BELOW:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS
---------------	------------	----------------

*** NO INGREDIENT CITATIONS ***

--- KEY TO LIST CITATIONS ---

1 = OSHA,	2 = ACGIH,	3 = IARC,	4 = NTP,	5 = NCI,
6 = EPA CARC,	7 = NFPA 49,	8 = NFPA 325M,	9 = DOT HMT,	10 = CA RTK,
11 = IL RTK,	12 = MA RTK,	13 = MN RTK,	14 = NJ RTK,	15 = NJ SHH,
16 = FL RTK,	17 = PA RTK,			

FOR MOBIL USE ONLY: (FILL NO: MTL231A2A005) MHC: 1* 1* NA 0* 1* PPEC:
US84-373 APPROVE REVISED: 04/16/85 NEW PRODUCT MSDS

PREPARED BY: MOBIL OIL CORPORATION
ENVIRONMENTAL AFFAIRS AND TOXICOLOGY DEPARTMENT, PRINCETON, NJ
FOR FURTHER INFORMATION, CONTACT:
MOBIL OIL CORPORATION, PRODUCT FORMULATION AND QUALITY CONTROL
3225 GALLOWES ROAD, FAIRFAX, VA 22037 (703) 849-3265

INFORMATION GIVEN HEREIN IS OFFERED IN GOOD FAITH AS ACCURATE, BUT
WITHOUT GUARANTEE. CONDITIONS OF USE AND SUITABILITY OF THE PRODUCT FOR
PARTICULAR USES ARE BEYOND OUR CONTROL; ALL RISKS OF USE OF THE PRODUCT
ARE THEREFORE ASSUMED BY THE USER AND WE EXPRESSLY DISCLAIM ALL
WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF
MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE
USE OR SUITABILITY OF THE PRODUCT. NOTHING IS INTENDED AS A
RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR AS EXTENDING
LICENSE UNDER VALID PATENTS. APPROPRIATE WARNINGS AND SAFE HANDLING
PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS.

WESTSIDE LANDFILL, INC.

P. O. BOX 350
THREE RIVERS, MICHIGAN 49093

September 7, 1989

Mr. Keith B. Kling
Menasha Corporation
Environmental Supervisor
P. O. Box 155
Otsego, MI 49078-0155

Dear Keith:

Thank you for accompanying me to the two sites you described in your letter of September 1, 1989.

We are considering the new material you will excavate from the area you excavated in March as an extension of our job #1026. It would be a great help to us if this number could be placed on a bill of lading. If you do not use a bill of lading, this number should appear on each individual landfill ticket. You indicate that an HNu meter will be used to detect diesel fuel constituents. I assume that it will be operated by your consultant. This material is approved for disposal.

The material we discussed near your #2 truck dumper is also approved for disposal. We have assigned the number #1109 to it. We understand that you intend to start this project in late September.

We appreciate this opportunity to satisfy your disposal needs.

Sincerely,

WESTSIDE LANDFILL, INC.



Chris Coniglio
Admn. Assistant

CC/jm



October 2, 1989

Mr. Keith Kling
Menasha Corporation
320 North Farmer Street
Otsego, Michigan 49078

RE: Soil Remediation at Previous Fueling Area, Otsego Paperboard Plant

Dear Mr. Klinge:

The purpose of this letter report is to document the soil remediation which was performed in the chipping yard where the truck fueling area previously existed. As you know, contamination from fuel products in the fueling area was identified as part of the contamination survey for the entire site which was performed in August of 1987. This report is prepared pursuant to our proposal of August 30, 1989.

As we have discussed, the probable source of the fuel contaminated soils was over-filling at the fuel pumps. Specifically, the area of remediation was a low area, west of the previous pump location, where surface drainage focused, allowing fuel products to come into contact with surface soil. The remediation area was immediately adjacent to an old fueling building, which was demolished several years ago. Finally the underground storage tank which supplied the pumps was removed in 1987 by Menasha Corporation. This removal was documented by Menasha Corporation and reviewed by representatives of the MDNR.

The remediation began at approximately 9:15 a.m. on the 18th of September, 1989. Menasha Corp. contracted with Cushman Excavating to perform the excavation. Initially, the contractor began excavating in the area where the soil contamination was previously encountered. Excavation radiated out from this point until no contamination was evident visually, olefactorily, or through the use of an HNU meter. The HNU meter, equipped with 10.2 eV lamp, is a portable trace gas analyzer used to scan soils for the presence of volatile organic compounds typically found in fuel products. In general, during this remediation, the presence of volatile organic compounds was noted by HNU readings ranging between 1 and 10 ppm. At the point when contamination was not evident, the excavation was extended one additional foot in all directions. This simple method of over-excavation has, in past experiences, proved successful in final remediation of the excavation.

Figure 1 represents the excavation after it was completed. Based on the dimensions of the excavation, it is estimated that 60 cubic yards (in-place volume) of soil were removed. STS understands that disposal of the soil was performed by the contractor at Three Rivers Landfill in Three Rivers, Michigan.

STS Consultants Ltd.
Consulting Engineers

3340 Ranger Road
Lansing, Michigan 48906
517.321.4964/Fax 517.321.2132

Menasha Corporation

Page 2

As stated above, the excavation was carried past the limits of where the HNU meter detected positive for organic compounds. After excavation was complete, soil samples were collected from the walls and base of the excavation for laboratory analysis. Results of the chemical analysis are shown on Table 1, below, with the laboratory data sheets included in the appendix.

Table 1
Summary of Analytical Analysis

Sample(s)	Description	Result (mg/l)	
		BTEX*	TPH**
S-1 - S-5	Walls of Excavation	< 0.01	< 0.01
S-6	Base of Shallow End of Excavation	< 0.01	< 0.01
S-7	Base of Deep End of Excavation	< 0.01	< 0.01

* Benzene, Toluene, Ethyl Benzene, o,p,m-Xylene

** Total Petroleum Hydrocarbons

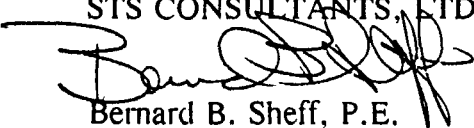
As can be seen from the table, the analytical results of the soil samples show no detection above 10 ppb.

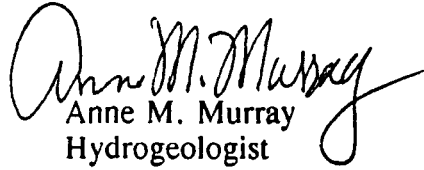
Based on the visual observations, results of HNU meter scan in the field, and the on-set of laboratory analysis, as presented in this report, it would appear that excavation of the contaminated soil has left no soil with contamination above current laboratory detection limits. STS does not recommend further remediation in this area other than the currently-planned capping of the immediate vicinity with asphalt paving to mitigate surface infiltration.

STS has enjoyed the opportunity to again work with the staff of Menasha Corporation on this project. If you have any questions regarding this letter or require additional information, please feel free to contact me.

Sincerely,

STS CONSULTANTS, LTD.


Bernard B. Sheff, P.E.
Senior Project Engineer
Area Manager


Anne M. Murray
Hydrogeologist

SODIUM SILICATE MSDS

DOCUMENT #4

Material Safety Data Sheet

MSDS: 1696

DS: 1696 - SODIUM SILICATE

Int #: 801 Corporate MSDSS ===== 6/28/95

Status: Pending

Revised: 6/26/91

Formula: NOT GIVEN

Part Number: NOT GIVEN

Specification: NOT GIVEN

Keyword: NOT GIVEN

Synonyms:

NOT GIVEN

Stock Items: NOT GIVEN

Manufacturer

PQ CORP.

11 EXECUTIVE MALL PO BOX 840

VALLEY FORGE, PA 19482

Phone:

Emergency: 215-293-7200

Supplier

PQ CORP.

11 EXECUTIVE MALL PO BOX 840

VALLEY FORGE, PA 19482

Phone:

Emergency: 215-293-7200

Physical/Chemical Characteristics

Boiling Point: NA

NOT APPLICABLE.

Melting Point: NG

Freezing Point: NG

Pour Point: NG

Softening Point: NG

Specific Gravity: BT

1.3

1.5

LIQUIDS ONLY.

Vapor Pressure: NA

NOT APPLICABLE.

Vapor Density: NA

NOT APPLICABLE.

Percent Volatiles: NG

Evaporation Rate: NA

NOT APPLICABLE.

pH: BT

11

13

AQUEOUS LIQUIDS ONLY

Molecular Weight: NG

Viscosity: NG

Solubility in Water ...: COMPLETE.

Odor/Appearance/Other Characteristics:

NO ODOR/VISCOUS LIQUID, COLORLESS TO HAZY.

Fire and Explosion Data

Closed Cup Flash Pt. .: NA

NOT APPLICABLE.

Open Cup Flash Point .: NA

NOT APPLICABLE.

Fire Point: NG

Auto Ignition: NG

Lower Explosion Limit : NA

NOT APPLICABLE.

Upper Explosion Limit : NA

NOT APPLICABLE.

Shipping Regulations

UN/NA Number: NG

DOT Hazard Class: NOT APPLICABLE

Shipping Label: NOT GIVEN

Shipping Name: NOT APPLICABLE

Material Safety Data Sheet

MSDS: 1696

SDS: 1696 - SODIUM SILICATE

Int #: 801 Corporate MSDSs ===== Page 2

Prepared

Preparer's Name & Title: JOHN G. BLUMBERG, PRODUCT SAFETY COORDINATOR

Preparation Date: 11/11/85

Component(s):

SODIUM SILICATE

OSHA Pel: NE ppm

ACGIH TLV: NE ppm

STEL: NG ppm

Percent of Product: NG

CAS No.: 1344098

Note: * TLV: NOT ESTABLISHED.

Text Section(s)

IDENTIFICATION OF PRODUCT

SEE DATA PAGES FOR ADDITIONAL INFORMATION.

SALES NAME: O(R) sodium silicate solution.

CHEMICAL NAME: Silicic acid, sodium salt*.

EMERGENCY TELEPHONE NUMBER: (215) 293-7200.

TSCA CAS REGISTRY NO.: 1344-09-8.

DOT HAZARD CLASS: N.A.

DOT SHIPPING NAME: N.A.

DOCUMENT 0297A.

REPLACES SS-3L.

CAUTIONARY CODE: 91L.

PHYSICAL DATA

SEE DATA PAGES FOR ADDITIONAL INFORMATION.

Material Safety Data Sheet

MSDS: 1696

DS: 1696 - SODIUM SILICATE

Unit #: 801 Corporate MSDSs ===== Page 3

SOLIDS CONTENT (SOLUTIONS DISPERSIONS, OR PASTES ONLY): Within a range of 30-53% by wt.

FIRE AND EXPLOSION HAZARD DATA

SEE DATA PAGES FOR ADDITIONAL INFORMATION.

FIRE EXTINGUISHING MEDIA: N.A.

SPECIAL FIRE FIGHTING PROCEDURES: N.A.

UNUSUAL FIRE AND EXPLOSION HAZARDS: N.A.

REACTIVITY DATA

STABILITY: Stable.

CONDITIONS TO AVOID: Flammable hydrogen gas may be produced on prolonged contact with metals such as aluminum, tin, lead, and zinc.

INCOMPATIBILITY (MATERIALS TO AVOID): Gels when mixed with acid.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen.

SPILL OR LEAK PROCEDURES

ENVIRONMENTAL HAZARD: High pH (alkalinity) of undiluted or unneutralized material is harmful to aquatic life.

SPILLAGE: Sinks and mixes with water.

SMALL QUANTITIES (LESS THAN 100 GAL.): Mop up and flush to sewer with plenty of water.

LARGE QUANTITIES: Isolate, dike and store discharged material, if possible. Otherwise disperse and flush with water. Observe environmental protection regulations.

Material Safety Data Sheet

MSDS: 1696

SDS: 1696 - SODIUM SILICATE

Print #: 801 Corporate MSDSs ===== Page 4

WASTE DISPOSAL METHOD:

SMALL QUANTITIES (LESS THAN 100 GAL.): Flush to sewer with plenty of water.

LARGE QUANTITIES: Neutralize with dilute acid and landfill solids according to local, state, and federal regulations. Flush neutral liquid to sewer with plenty of water.

HEALTH HAZARD DATA

EYE CONTACT: Causes irritation.

SKIN CONTACT: Causes irritation.

INHALATION: Causes irritation.

INGESTION: Causes irritation.

CHRONIC HAZARD: No known chronic hazards.

FIRST AID PROCEDURES: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician. Flush skin with water. If swallowed, do NOT induce vomiting. Give large quantities of water or milk. Call a physician.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Use NIOSH approved mist respirator where spray occurs.

GLOVES: Rubber where contact likely.

EYE PROTECTION: Chemical goggles and/or face shield.

OTHER PROTECTIVE EQUIPMENT: Safety shower and eyewash fountain should be within direct access.

PERSONAL HYGIENE: Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Wash contaminated clothing before re-use.

Material Safety Data Sheet

MSDS: 1696

DS: 1696 - SODIUM SILICATE

Unit #: 801 Corporate MSDSs ===== Page 5

ENGINEERING CONTROL: N.A.

SUBSTANCES FOR WHICH STANDARDS HAVE BEEN SET

OSHA Permissible Exposure Limit or ACGIH Threshold Limit Value have not been established. PQ recommended Ceiling limit 5mg/m3.

EXPOSURE ANALYSIS METHODS: Bubble sample through standardized acid solution and titrate.

SPECIAL NOTES

N.A. = Not Applicable.

*Includes other hazard classes, to which different safety data sheets apply.

End of MSDS

MATERIAL SAFETY DATA SHEET

SECTION I			
Manufacturer's Name		Philadelphia Quartz Company	Emergency Telephone No. 215-447-7200
Address (Number, Street, City, State, and Zip) Public Ledger Building - Independence Square			
Chemical Name and Synonyms		Sodium Silicate	Trade Name and Synonyms SS-C Pwd.
Chemical Family		Alkali Silicates	Formula $\text{Na}_2\text{O} \cdot 2\text{SiO}_2$

SECTION II HAZARDOUS INGREDIENTS						
PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)	
Pigments			Base Metal			
Catalyst			Alloys			
Vehicle			Metallic Coatings			
Solvents			Filler Metal			
Additives			Plus Coating or Core Flux			
Others			Others			
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES					%	TLV (Units)
Contains 32.70% Na_2O , 65.40% SiO_2						

SECTION III PHYSICAL DATA			
Boiling Point ($^{\circ}\text{F.}$)	N.A.	Specific Gravity ($\text{H}_2\text{O}=1$)	73#/cu.ft.
Vapor Pressure (mm Hg.)	N.A.	Percent Volatile By Volume (%)	N.A.
Vapor Density (Air=1)	N.A.	Evaporation Rate (_____ = 1)	N.A.
Solubility in Water	Soluble in all proportions		
Appearance and Odor	White odorless powder		

SECTION IV FIRE AND EXPLOSION HAZARD DATA			
Flash Point (Method Used)	None	Flammable Limits	None
Extinguishing Media	None required		
Special Fire Fighting Procedures	None		
Unusual Fire and Explosion Hazards			
Material is not explosive and not flammable.			

Pkg. Dim. (OD):

Gross Wgt.:

SECTION V HEALTH HAZARD DATA

Threshold Limit Value N.A.

Effects of Overexposure Irritation to skin and eyes

Emergency and First Aid Procedures Flush immed. for 15 min. with water; for eyes, flush with water for 15 min. and call a physician.

SECTION VI REACTIVITY DATA

Stability

Unstable

Stable

Conditions to Avoid

Incompatibility (Materials to avoid)

Hazardous Decomposition Products

Hazardous

Polymerization

May Occur

Will not Occur

Conditions to Avoid

SECTION VII SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled Sweep and dispose to chemical dump or flush with large volume of water to sewer.

Waste Disposal Method See above

SECTION VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify type)

Ventilation

Local Exhaust

Yes

Mechanical (General)

Special

Other

Protective Gloves

Yes

Eye Protection

Yes

Other Protective Equipment

None

SECTION IX SPECIAL PRECAUTIONS

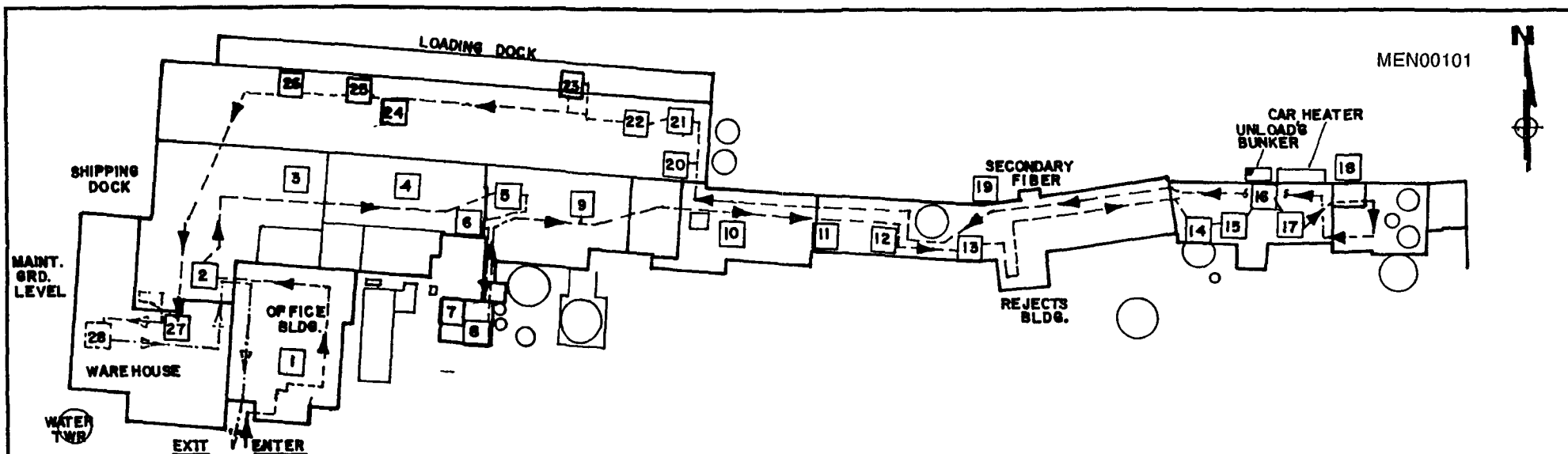
Precautions to be Taken in Handling and Storing Do not store in high heat and humidity in order to prevent caking.

Other Precautions

**MILL LINE
DRAWINGS
COVERING 1954-
1990**

DOCUMENT #5

MEN00101



- | | | | |
|-----------------------------------|------------------------------------|--|---------------------------------|
| 1 NEW OFFICE BUILDING | 9 PRIMARY REFINERS | 17 NO.4 POWER BOILER | 25 NO.1 P.M. DRYEND CONTROL RM. |
| 2 LABORATORY | 10 CHIPPER ROOM | 18 SPENT LIQUOR INCINERATOR CONTROL ROOM | 26 NO.1 P.M. WINDER |
| 3 NO. 2 PAPER MACHINE | 11 SECONDARY FIBER BALE STORAGE | 19 CHIP YARD | 27 WAREHOUSE |
| 4 NO.2 P.M. REFINER & FOURDRINIER | 12 SECONDARY FIBER HANDOUT STATION | 20 NO.1 PAPER MACHINE | 28 MAINTENANCE |
| 5 SINCLAIR WHITE WATER SCREEN | 13 SECONDARY FIBER CONTROL RM. | 21 NO.1 P.M. REFINERS | |
| 6 IMPCO DISC SAVE-ALL | 14 TURBINE GENERATOR | 22 NO.1 P.M. FOURDRINIER | |
| 7 DIGESTER | 15 NO.1 POWER BOILER | 23 NO.1 P.M. CONTROL ROOM | |
| 8 DIGESTER CONTROL ROOM | 16 POWERHOUSE CONTROL ROOM | 24 NO.1 P.M. DRYER & REEL | |

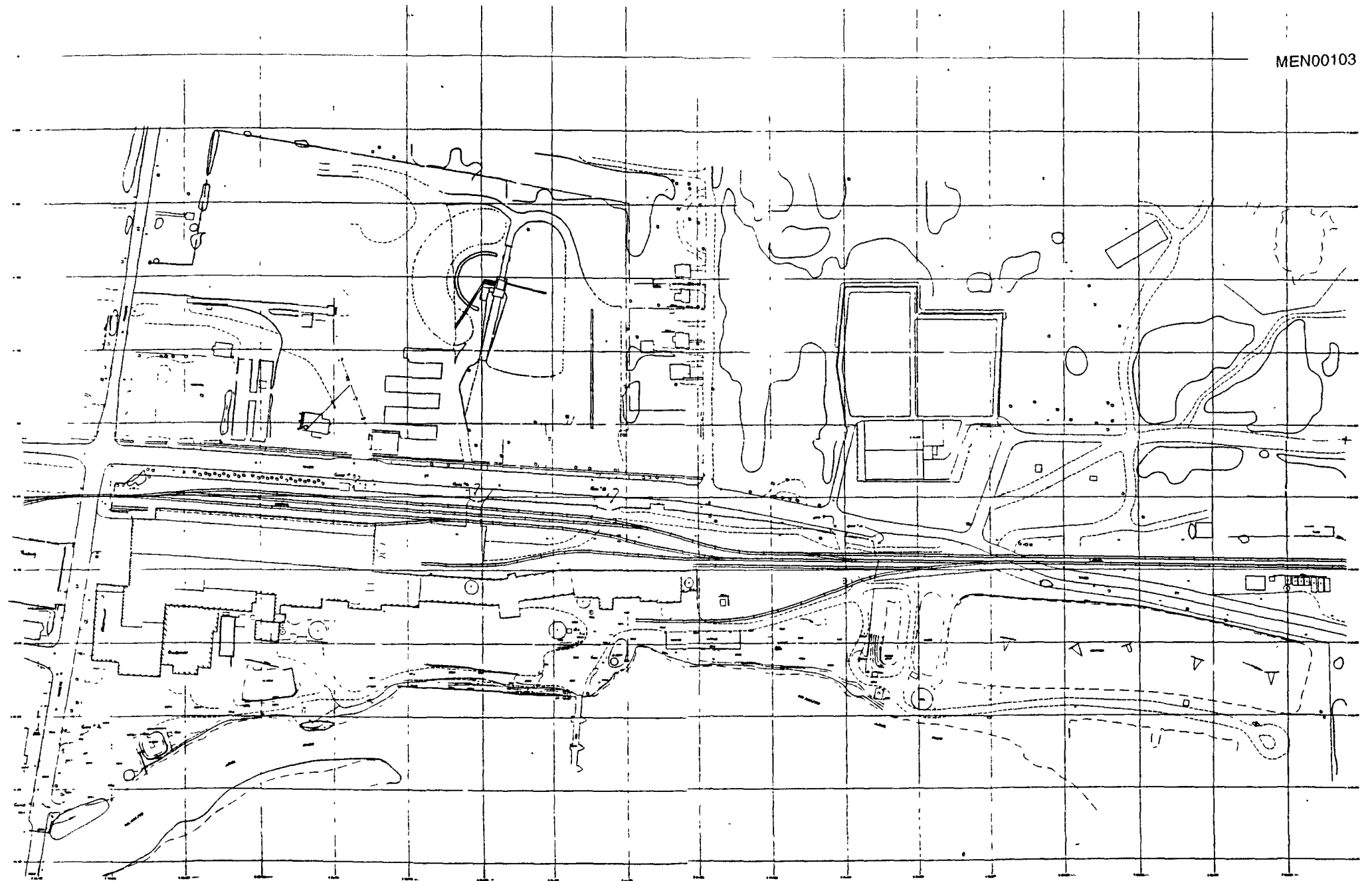


MENASHA CORPORATION

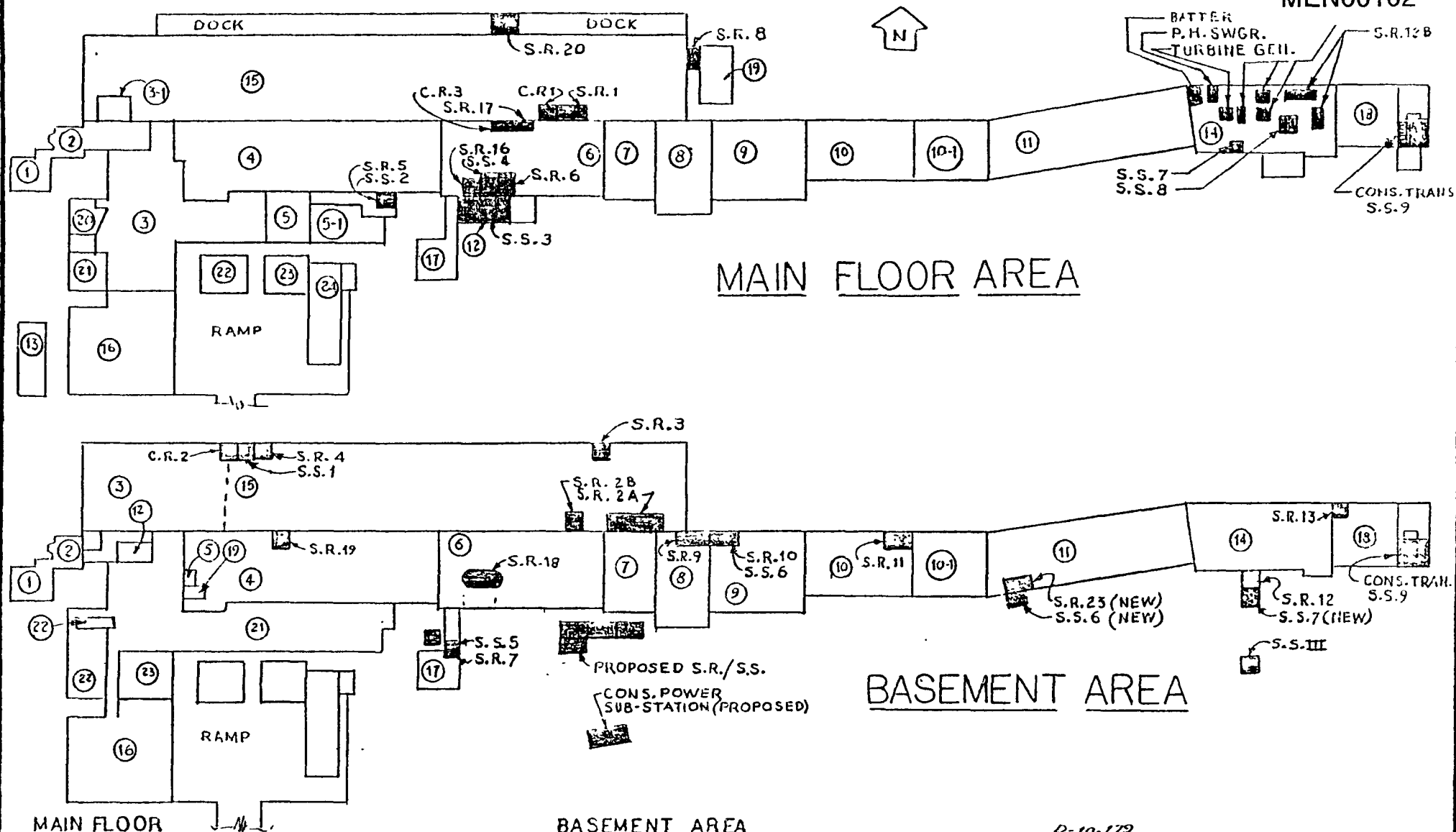
OTSEGO MILL BOX 155, 320 N. FARMER ST. OTSEGO, MI.

1937

MEN00103



MEN00102



1. OFFICE
2. OFFICE
3. SHIPPING DEPT.
- 3-1. SHIPPING OFFICE
4. NO. 2 MACH. ROOM
5. TECHNICAL DEPT.
- 5-1. TECHNICAL OFFICES
6. BEATER ROOM
7. COOKER ROOM
8. CHIPPER ROOM
9. BARKER ROOM
10. CHEMICAL ROOM
- 10-1. HYDRAPULPER AREA
11. WASTE PAPER AREA
12. SWITCHING BEATER ROOM
13. OFFICE GARAGE

14. POWER PLANT
15. NO. 1 MACH. ROOM
16. ROLL STORAGE
17. DIGESTER BLD'G.
18. S.L.I.
19. CHEMICAL SILOS
20. LUNCH ROOM
21. ENG'R. DEPT.
22. MAINT. GARAGE
23. STEEL STORAGE
24. LARGE W.W. CHEST

1. OFFICE
2. OFFICE
3. PROJECT STORAGE
4. NO. 2 MACH. ROOM BSM'T.
5. OIL ROOM
6. BEATER ROOM BSM'T.
7. COOKER ROOM BSM'T.
8. CHIPPER ROOM BSM'T.
9. BARKER ROOM BSM'T.
10. CHEMICAL ROOM BSM'T.
11. WASTE PAPER ROOM BSM'T.
12. INSTRUMENT SHOP
14. POWER HOUSE BSM'T.
15. NO. 1 MACH. ROOM BSM'T.
16. ROLL STORAGE BSM'T.
17. DIGESTER BSM'T.
18. S.L.I. BSM'T.

19. ELECT. SHOP
20. PURCHASING OFFICE
21. NO. 2 MACH. ROOM BSM'T.
22. STORE ROOM
25. MAINI. TOILET/SHOWERS

D-10-179
REF. DWG'S. D-10-178



MENASHA CORP.
PAPERBOARD DIV., OTSEGO, MICH.

SUBJECT SWITCHROOMS; SUB-STATIONS;
BUILDING NOMENCLATURE & DEPARTMENT
LOCATIONS

SCALE none

DRAWN merlin

DRAWING NUMBER

DATE 7-1-81

APP'D.

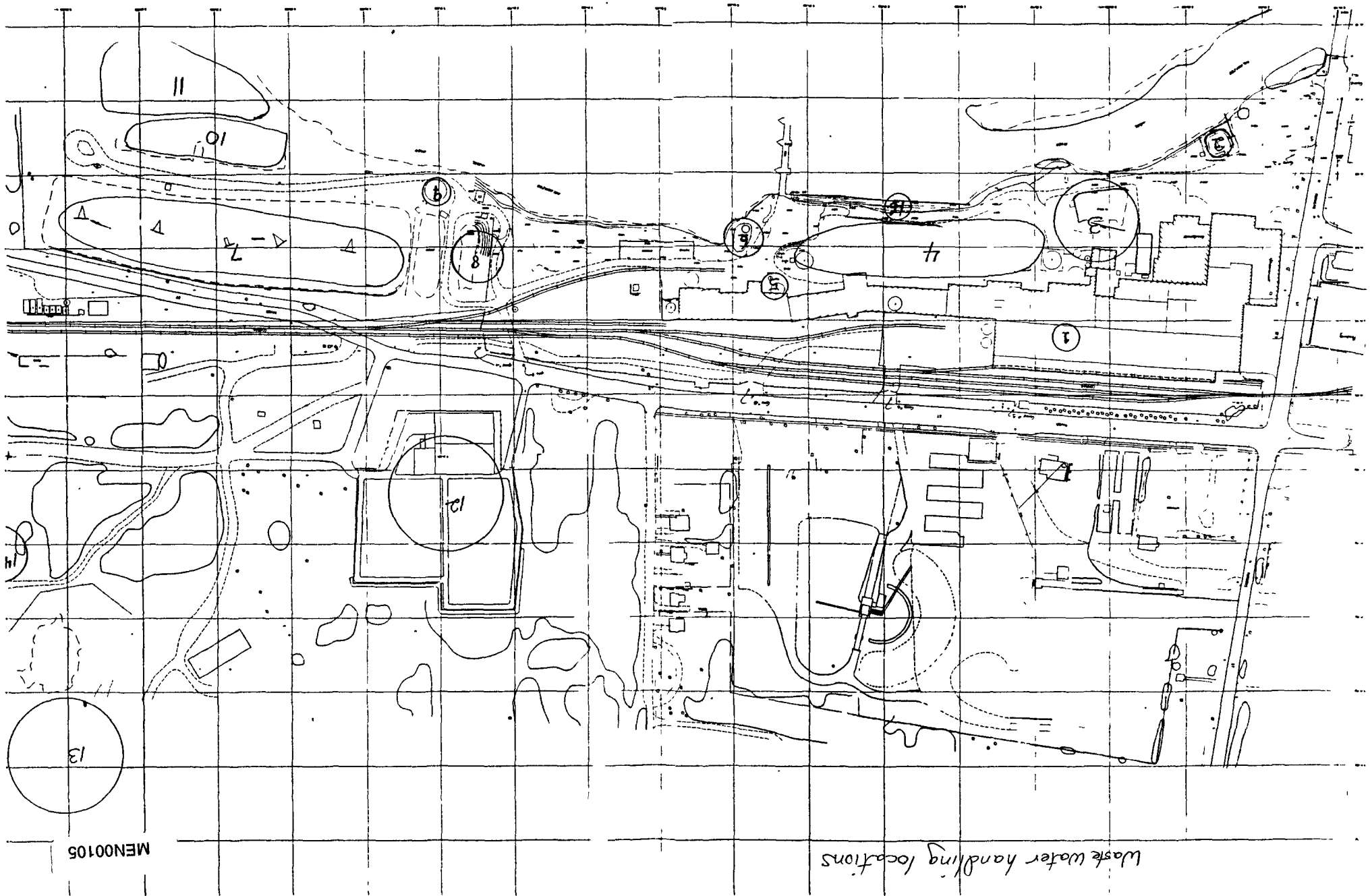
A-N B3-277

**MILL DIAGRAM
IDENTIFYING
PHYSICAL
WASTEWATER
LOCATIONS**

DOCUMENT #6

Waste water handling locations

MEM00105



LIQUOR POND CLOSURE

DOCUMENT #7

*Memo***PAPERBOARD DIVISION** **MENASHA CORPORATION**

TO: John Bonham
FROM: Keith Kling *KBK*
DATE: April 27, 1994
SUBJECT: Liquor Pond Closure

=====

In response to Solar Turbines questions concerning the proposed location of the cogeneration building, I have completed the following research.

From the 1940's until 1982, spent cooking liquor was stored in an unlined pond south of the mill in the area now proposed for the cogeneration project. In 1982 Menasha Corporation built two tanks and a lined lagoon to hold spent liquor. This project was completed to improve mill operations and to ensure our environmental responsibility. Michigan Department of Natural Resources (MDNR) was pleased with this direction but had not required the project.

Following successful tankfarm operation, a closure plan for this and one other pond was developed and submitted to Corporate office. A copy of the summary report is attached as Document #1.

Following funding approval, a comprehensive cleanup plan was developed and was reviewed with MDNR on Feb. 23, 1983. A copy of the meeting minutes is attached as Document #2.

MDNR requested several tests be run as shown in a letter by Garth Aslakson. This is attached as Document #3. The results of the testing are shown in Document #4. Following review of the test data, MDNR gave approval of this project. This is attached as Document #5.

The testing clearly indicated the non-hazardous nature of this material. As of this date, our company still receives referrals from MDNR during the summer for use of liquor as a dust control agent. I discussed the details of this project with Fred Morley of MDNR on April 19, 1994. He indicated that due to the voluntary nature of the closure, the non-hazardous nature of the substance and the lack of indication of leaching from the pond, MDNR did not require a formal closure document.

KBK/alp

DOCUMENT

#1

NATURE OF EXISTING FACILITIES

Since December of 1982 the liquor and sludge storage tank farm has been storing both weak and intermediate liquor. With the installation of the tank farm, the unlined liquor ponds are no longer required to store weak liquor.

Spent liquor still remains in the two ponds. The "main pond" is located south of the mill in an old millrace channel. The "back pond" is located at the east end of the property between the waste treatment plant basin and the Kalamazoo River. Both ponds contain sludge deposits consisting of a combination of fiber and liquor precipitates. Estimated volumes of liquor and sludge remaining are given below:

	<u>Main Pond</u>	<u>Back Pond</u>
Liquor Volume	1,849,000 gal.	2,692,000 gal.
Heavy Sludge Volume	1,278 cy	2,963 cy

WHERE INADEQUATE

In Michigan, all discharges of materials to the ground waters are regulated by the Part II Ground Water Quality Rules of Act 245. Rule 2206 states that "Discharges into ground waters of the State are regulated by permits issued in accordance with sections 7 (1) and 8 (b) of the Act." Rule 2205, paragraph I, states that "The quality of ground waters and all useable aquifers shall not be degraded from local background ground water quality as result of a discharge except as provided in Rule 2210". Paragraph III states that no materials that have concentrations of contaminants higher than the National Primary Drinking Water Quality Standards can be discharged to the ground waters even if the background concentrations of these materials already exceed the drinking water standards. We do not have a ground water discharge permit for any seepage or diffusion that may occur from any of these ponds.

Because there are no barriers to prevent a ground water discharge, the MDNR maintains that it must be assumed there is a ground water discharge taking place. Therefore, a ground water discharge permit is required for these ponds. However, if any of the material from either of these types of ponds is being discharged to the ground water, it would degrade the ground water quality above background levels and the contaminant concentration would be greater than drinking water quality standards, thus violating both paragraphs I and III of Rule 2205. Therefore, no ground water discharge permit could be issued for these ponds. The only way we could continue to use the existing liquor storage ponds would be to prove that there is no discharge from them to the ground water. If this is indeed the case, it could cost us a great deal of money and still be impossible to prove because ground water in the area

is already slightly contaminated from an incident in 1973 with the same materials that would be seeping from the liquor storage ponds. As long as these unlined ponds are in use, we have an environmental liability that could amount to several million dollars if we are required to correct a ground water contamination problem.

PROPOSED REMEDY

To achieve the most cost-effective closure, a two-year plan will be implemented. The first year will be spent on closing the main pond, and the second year will be spent on closing the back pond. A small section of the main pond has been isolated and designated as a mixing pond. Liquor from the main pond will be pumped into the mixing pond where it will be diluted with liquor from the weak liquor tank. This is necessary to create an acceptable consistency for the liquor to be applied as road-binder. Due to the heaviness of the pond liquor, it is expected that the average dilution ratio for acceptable roadbinder will be three parts weak liquor to one part pond liquor.

After agitation in the mixing pond, the liquor will be pumped through a screening system consisting of a selectifier screen and a Jonsson screen. The rejects from the Jonsson screen, mostly plastics, will be temporarily stockpiled at the back pond. The accepts from the system will be pumped to the existing liquor loading station at the east end of the mill. The liquor will be hauled out in tank trucks and applied to dirt and gravel roads in eight surrounding townships. This hauling will continue for as long as possible from the main pond. When the bottom of the pond is reached, and the liquor becomes a heavy sludge, it will be necessary to mix this to an acceptable consistency with oversized wood chips and fines, and to haul the sludge to the class II landfill at Watervliet. It is estimated that the bottom two feet of both ponds will have to be disposed of in this way. Note that this is only an estimate as there is no way to accurately assess sludge depth at this time.

After the main pond has been emptied of liquor and sludge, it will be charged with a sand and gravel mix and compacted to provide an acceptable soil for future construction. The mixing pond will be left open until the back pond is closed.

It is expected to take the entire first summer to close the main pond. The second summer will be spent on closing the back pond in a similar fashion to the main pond. Not as much fill will need to be hauled in as the existing dikes can be pushed in once the pond is empty.

After both ponds are closed, the existing pump stations, screening station and old bridge will be demolished. In addition, the weak liquor tank will be enclosed by a dike which is capable of holding 1.5 times the tank volume in accordance with the MDNR requirements.

A sump with a pump will be required inside the dike. The pump will be one of the existing liquor pumps which is no longer required.

It should be noted that an excessively wet summer will severely hinder our roadbinder program. If this happens, we will either have to incur additional expense in order to stay on schedule, or delay the project time line, whichever is most appropriate.

PROJECT IMPACT ON MILL STRATEGIC PLAN

The largest single area to the south side of the mill is the main liquor pond. Any expansion related to the secondary fiber operation would logically be to the south of the mill. A reject handling building and additional bale storage building are proposed for the site. Construction of the reject handling building will need to be complete by the end of July 1984.

FINANCIAL AND INTANGIBLE BENEFITS

This project is essential to maintain operations and comply with the MDNR requirements. Failure to comply with the MDNR environmental requirements would result in adverse consequences. Additionally, this project upholds Menasha's civic responsibility to insure a clean environment exists for the community.

DOCUMENT

#2

MINUTES OF MEETING

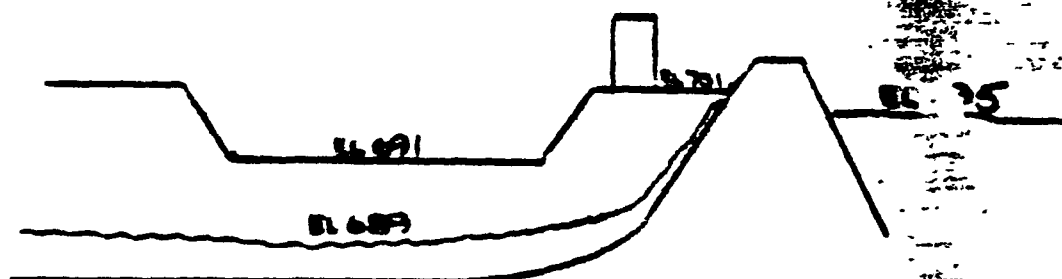
DATE: February 23, 1983

DATE SUBMITTED: February 25, 1983

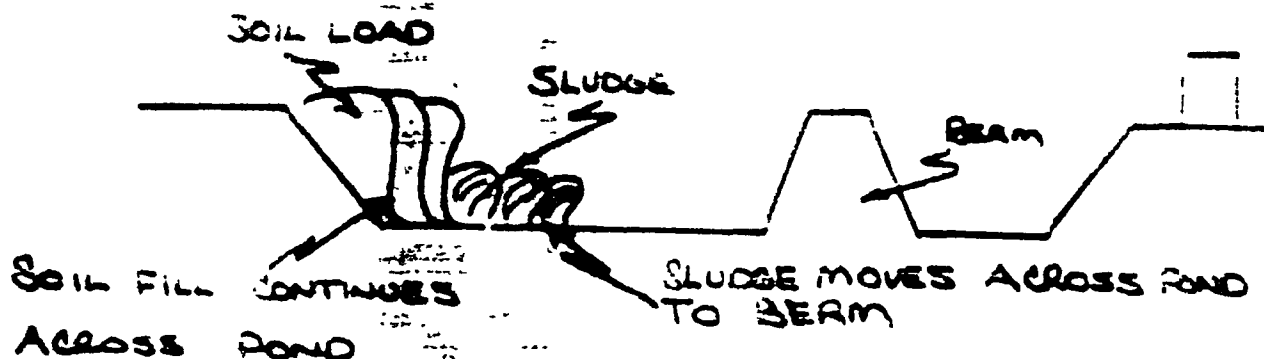
THOSE PRESENT: Menasha: David Rao, Bruce Buchanan, John Blauwkamp, Herb Smiley, Jerry DeVisser--
DNR: Fred Morely, Garth Aslaxson, Marge Spruit

SUBJECT: Liquor Pond Closure

1. Menasha presented the proposed plan of closure for the liquor ponds to the DNR people. David Rao showed a cross section (east-west) of the pond and its relationship to the dam and river.



2. The emphasis in liquor removal will go to the roadbinder program. Menasha's plans are to remove the majority of liquor under this concept. The DNR people reacted favorably to this proposal.
3. The DNR people conceded that the vacuum cleaner approach would be cost-prohibitive.
4. Menasha presented a method to remove the liquor and sludge. The process would begin by placing a berm across the pond, agitating the pond with the manure pump and then pumping as much as possible over to the pond side of the berm. We would add a soil load on one end, forcing the sludge to the berm and then removing it with a dredge.



5. An alternate method would be to drag the entire pond, removing sludge and soil.
6. No decision could be made as we could not determine how clean the area must be upon completion.
7. We will meet again on March 23, 1983 at 10:00 A.M.. At that meeting Monahan will provide:

Leachate test
 EP toxicity test
 Core samples analysis

The DNR will:

Check our roadbinder authorization.
 Review procedure for closure.

HS/em
 NOS

DOCUMENT

#3

STATE OF MICHIGAN



NATURAL RESOURCES COMMISSION

ALGER A. HOFFER
 1 10 LAFAYETTE
 ALGER A. HOFFER
 1000 N. HARRIS
 HARRIS N. HARRIS

JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

March 2, 1983

Mr. John Slawson
 Menasha Corporation
 P.O. Box 155
 Okeage, Michigan 49078

Dear Mr. Slawson:

At our meeting last week we discussed the closure of Menasha's spent liquor lagoon. One of the closure options considered was burial of the lagoon sediments at the present location. On-site burial would require that Section-6 of Act 265 be satisfied. Section-6 states that activities which "are or may become injurious to the waters of the state" are unlawful.

You requested guidance as to what chemical analysis would be required before the Department of Natural Resources would consider on-site burial of the sediment from the spent liquor lagoon. Menasha should perform an EP toxicity test, an analysis for PCB, and an analysis for sulfite of the sediment portion of the spent liquor lagoon. After examination of these test results, the Department will advise whether or not we would authorize on-site burial of the lagoon sediments.

If you have any questions, please call me at (517) 373-3710.

Sincerely,

Garth Aslakson
 Water Quality Specialist
 Surface Water Quality Division

cc: F. Blakeslee/SWQD file
 B. Marks
 M. Spruic

Specific Metals Analysis
 should include.

1. Cadmium
2. Chrome
3. Mercury
4. Lead

2-3-83
 gha.

DOCUMENT

#4

PURPOSE

The purpose of this study is to evaluate the sludge from Menasha Corporation, Oshtemo, Michigan, to determine the nature of the leachable constituents for waste disposal. This evaluation will define the possible waste classification in accordance with the criteria set forth in the May 19, 1980, Federal Register, Volume 45, Number 98, 40 CFR Part 261.24, Characteristics of EP Toxicity, Appendix II to that subpart, and the Michigan Department of Natural Resources (DNR) Act No. 64 of the Public Acts of 1979.

METHOD AND PARAMETER LIST SECTION

The method selected was the EP Toxicity Study using the Michigan DNR parameters listed in Act No. 64.

The method and parameter list were provided to Western Michigan Environmental Services, Inc. (ESI) through discussions with John Blauwkamp of Menasha Corporation and William Bouma of ESI.

Chromium	ASTM Method D1137 and Standard Methods Part 32A
Copper	ASTM Method 38 and Standard Methods Part 3A
Lead	ASTM Method D1559 and Standard Methods Part 313A
Mercury	Cold Vapor Procedure, EPA Method 7470
Nickel	ASTM Method D188 and Standard Methods Part 321A
Selenium	EPA Method 7740
Silver	Standard Methods Part 324A
Zinc	ASTM Method D1691 and Standard Methods Part 328A

WESTERN AMERICAN ENVIRONMENTAL SERVICES, INC.

PROCEDURE

The L-sludge leachate was prepared for analysis by the procedure of the Environmental Protection Agency (EPA) Test Methods for Evaluating Solid Waste, Second Edition, Physical/Chemical Methods, July, 1982, EP Toxicity Test.

The equipment utilized was an ESI EP Toxicity 6 solid waste rotary extractor operating at 29 rpm for twenty-four (24) hours as specified by the procedure. The sample and deionized water were placed into a one (1) gallon (4 liter) glass container and put into the rotary extraction apparatus.

The solid was prepared for extraction. During the extraction period, 0.5N Acetic Acid was added to adjust the pH to 5.0 ± 0.2 . After the extraction period, the final volume was adjusted to twenty (20) times the original sample weight with deionized water. The solid was then separated from the liquid phase by filtration through a 0.45 μ m filter. The resulting filtrate was then analyzed for the parameters listed on the Table of Results.

The analytical procedures and/or instruments utilized were as follows:

Solids, all forms	ASTM Method 1388 and Standard Methods Part 208.
Cyanide	EPA Method 9010
Metals, general	ASTM Method D2576 and Standard Methods Part 203 A utilizing an Atomic Absorption Spectrophotometer* (dual beam with D ₂ background correction)
Arsenic	EPA Method 7060
Barium	EPA Method 7081
Cadmium	ASTM Method D3557 and Standard Methods Part 310A

*Atomic Absorption Spectrophotometer
 Jerrell Ash Model 850
 Perkin Elmer Model 403
 Perkin Elmer Model 5000 with a HGA 500

NORTH AMERICAN ENVIRONMENTAL SERVICES, INC.

DESCRIPTION

The L-sludge consisted of shredded pieces of plastic, paper, leaves, and root-like material, all covered with a brown, oily substance. The sample had a very pungent septic smell.

Two hundred and twenty-nine (229) milliliters of 0.5N Acetic Acid were added to adjust the pH from 9.9 to 5.2 pH units.

The original sample contained 62.13% total solids, of which 86.0% were volatile and 14.0% were ash.

BP TOXICITY - TABLE OF RESULTS

Leachate Concentration
of
L-Sludge
from

Manasha Corporation
March 11, 1983

All results expressed as milligrams per liter (mg/l)

<u>PARAMETER</u>		<u>MAXIMUM CONCENTRATION</u>	
		<u>EPA</u>	<u>DNR</u>
Arsenic	<0.01	5.0	5.0
Barium	0.08	100.0	100.0
Cadmium	0.02	1.0	1.0
Chromium	0.10	5.0	5.0
Copper	0.07	---	100.0
Cyanide	<0.02	---	20.0
Lead	0.16	5.0	5.0
Mercury	0.001	0.2	0.2
Nickel	0.05	20.0	---
Selenium	<0.01	1.0	1.0
Silver	<0.005	5.0	5.0
Zinc	1.2	---	500.0

Original Sample:

Total Solids	62.13 % of sample
Volatile Solids	53.42 % of sample
Ash	8.71 % of sample

EST #830247

Liquor sludge dipped
from pond. Eventually
used as road binder
KBK 4/27/94

~~SOUTHERN MICHIGAN ENVIRONMENTAL SERVICES, INC.~~

CONCLUSION

The concentrations of the parameters evaluated have fallen well below the maximum concentration levels set by EPA and MSZ for the EP Toxicity Test. Therefore, this report should be submitted to the Michigan Department of Natural Resources, for approval of this waste material classified as non-hazardous.

PURPOSE

The purpose of this study is to evaluate the liquor pond sludge composite from Menasha Corporation, Oshtemo, Michigan, to determine the nature of the leachable constituents for waste disposal. This evaluation will define the possible waste classification in accordance with the criteria set forth in the May 19, 1980, Federal Register, Volume 45, Number 98, 40 CFR Part 161.24, Characteristics of EP Toxicity, Appendix A to that support, and the Michigan Department of Natural Resources (DNR), Act No. 64, of the Public Acts of 1979.

METHOD AND PARAMETER LIST SECTION

The method selected was the EP Toxicity Study using the Michigan DNR parameters listed in Act No. 64. Also requested for analysis was PCB (polychlorinated biphenyls) and sulfite.

The method and parameter list were provided to Western Michigan Environmental Services, Inc. (ESI) by Dave Schweizer, of Menasha Corporation.

WATKINS MICHAEL ENVIRONMENTAL SERVICES, INC.

PROCEDURE

The liquor pond sludge composite leachate was prepared for analysis by the procedure of the Environmental Protection Agency (EPA) Test Methods for Evaluating Solid Waste, Second Edition, Physical/Chemical Methods, July, 1982, IF Toxicity Test.

The equipment utilized was an ESI RF Toxicity 5 solid waste rotary extractor operating at 29 rpm for twenty-four (24) hours as specified by the procedure. The solid portion of the sample and deionized water were placed into a one (1) gallon (4 liter) glass container.

The original solid and liquid portions were separated. The original liquid was refrigerated at 4°C to be combined with the final leachate filtrate and analyzed. The solid was prepared for extraction. During the extraction period 0.5N Acetic Acid was added to adjust the pH to 5.0 ± 0.2 . After the extraction period the final volume was adjusted to twenty (20) times the original sample weight with deionized water. The solid was then separated from the liquid phase by filtration through a 0.45 um filter. The resulting filtrate was then analyzed for the parameters listed on the Table of Results.

The analytical procedures and/or instruments utilized were as follows:

Solids, all forms

ASTM Method 1888 and Standard Methods Part 208.

Cyanide

EPA Method 9010.

PCB

ASTM Method D3534 Utilizing Tracor-560 GC with $M1^{63}$ electron capture detector.

Sulfite

Standard Methods Part 428.

Metals, general

ASTM Method D2576 and Standard Methods Part 203 A utilizing an Atomic Absorption Spectrophotometer* (dual beam with D_2 background correction).

Arsenic

EPA Method 7060.

*Atomic Absorption Spectrophotometer

Jarrell-Ash Model 830

Parkin-Elmer Model 403

Parkin-Elmer Model 5000 with a M2A 500

WESTERN HICKMAN ENVIRONMENTAL SERVICES, INC.

DESCRIPTION

The liquor pond sludge composite was a dark brown liquid sludge. The sample was separated into the solid and liquid portions using centrifugation and vacuum filtration through 0.45 μ m membrane filters. The sample was extremely difficult to separate.

A 64.1 solid sample was finally separated. The liquid was placed in the refrigerator. 124.2 ml of 0.5N Acetic Acid were added to adjust the pH from 9.0 to 5.0. After extraction, the leachate was again separated using centrifugation, then vacuum filtration through 0.45 μ m membrane filters.

The original sample contained 27.26% total solids, of which 39.25% were volatiles and 60.75% were ash. The sample also contained <0.05 mg/kg PCB and 362 mg/kg sulfite.

TP ANALYSIS - TABLE OF RESULTS

Leachate Concentration
of
Liquor Pond Sludge Composite
(March 3, 1983)
Manasha Corporation
Otsego, Michigan
March 24, 1983

All results expressed as milligrams per liter (mg/l).

<u>PARAMETER</u>		<u>MAXIMUM CONCENTRATION</u>	
		<u>EPA</u>	<u>ME</u>
Arsenic	<0.003	5.0	5.0
Barium	0.02	100.0	100.0
Cadmium	0.01	1.0	1.0
Chromium	0.04	5.0	5.0
Copper	0.01	---	100.0
Cyanide	<1	---	10.0
Lead	0.06	5.0	5.0
Mercury	<0.001	0.2	0.2
Nickel	0.10	20.0	---
Selenium	<0.002	1.0	1.0
Silver	<0.005	5.0	5.0
Zinc	0.93	---	100.0

Original Sample:

Total Solids 27.26 % of Sample
Volatile Solids 10.70 % of Sample
Ash 16.56 % of Sample

ESI #830323

Sludge off bottom of
pond. Eventually mixed
with tractor mounted
pump and taken out
as road binder.

KBK - 4/27/84

SECTION 10.0000 ENVIRONMENTAL MONITORING, INC.CONCLUSION

The ZP Toxicity Study parameters have all fallen well below the maximum concentration levels set by the EPA and the DNR, and therefore, do not exhibit any KP Toxicity characteristics. This report should be submitted to the DNR of Michigan for a waste classification.



HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation

408 Auburn Avenue
Pontiac, MI 48058

313 334-1630
313 334-4747

4-15-83

MEN00129

Menasha Corporation
320 North Farmer Street
Otsego, MI 49078
Att: Mr. Roys

Sample received: 3-10-83

Hydro Number:	62354	62355	62356
Client I.D.	OW 1 16-17.5	OW 1 22-23.5	OW 2 24.5-26
Total Solids, %	86.2	84.8	84.0
Total Volatile Solids, %	(2.5) 2.1	(2.0) 1.7	(1.7) 1.4
Ash %	(97.5) 84.1	(98.0) 83.1	(98.3) 82.6

Results in parentheses are calculated on a dried wt. basis.

Test Results
from well cores taken
from well for
near liquor pond.

Core samples of soils
below liquor pond in
area proposed for
cogeneration facility.
Samples requested by MDNK
as part of closure plan.
KBC - 4/27/94

Linda Deans
Linda Deans
General Laboratory Manager



HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation

408 Auburn Avenue
Pontiac, MI 48058

313 334-1630
313 334-4747

4-15-83

MEN00130

Menasha Corporation
320 North Farmer Street
Otsego, MI 49078
Attn: Mr. Gary Roys

Sample received: 3-10-83

Hydro Number: 62354

Client I.D. OW 1

Phenol, mg/kg 3.6

Sodium, Na, mg/kg 190

Calcium, Ca, mg/kg 1400

Sulfate, SO₄, mg/l 160

Magnesium, Mg, mg/l 83

Carbonate, CO₃, mg/l
A trace amount of carbonate
(less than 1%) was detected

Iron, Fe, mg/l
A qualitative check for iron
using hydrochloric acid did not
indicate the presence of iron in
any appreciable quantities.

Test results are from core
sample at west end of
pond at 16-17.5 ft depth.
KBK - 4/27/94

Linda Deans

Linda Deans
General Laboratory Manager

Verastha, Corporation
Essex, Michigan

Analytical Results of
 Samples taken March 1, 1983

Parameter	Soil Sample O.W. #1 mg/kg	Soil Sample O.W. #2 mg/kg	Liquor Sample mg/l
Alkalinity (as CaCO_3)	2,520	1,670	19,700
Chlorides	<50	<50	250
C.O.D.	3,500	5,000	30,300
T.O.C.	350	565	10,600
Phenols	<0.1	<0.1	55.2
Sulfate	1,900	2,600	1,200
Sulfur, total	720	540	360
Sodium	230	410	5,750
Total Solids (%)	84.72	82.46	5.80
Volatle Solids (%)	1.30	0.94	2.90
Ash (%)	83.42	81.52	2.90

↓ Core Sample West end of pond.
 ↓ Core Sample South edge of pond.
 ↓ Liquid liquor from pond.
 KBK 4/27/94

[illegible]

REPORT NUMBER

~~SECRET~~

October 9, 1984

Manashe Corporation
P.O. Box 133
Chicago, MI 49078
ATTN: Keith B. Kling

DATE REC'D - 9-24-64

Soil samples from
bottom of pond
prior to filling
K BK - 4/27/94

LABORATORY NUMBER:

44812

44819

46820

SAMPLE IDENTIFICATION:

Leachte of
di Liver

Leachate of
#2 Liquor

Leachate of
#3 Lagoon

ANALYSIS:

Arsenic (mg/l)	< 0.01	< 0.01	< 0.01
Barium (mg/l)	3.74	0.58	1.43
Cadmium (mg/l)	0.020	0.020	0.043
Total Chromium (mg/l)	0.03	0.04	0.18
Lead (mg/l)	0.03	0.02	0.07
Mercury (mg/l)	0.0099	0.0042	0.0042
Selenium (mg/l)	0.001	0.001	0.001
Silver (mg/l)	0.02	0.02	0.05

NOTE: Organics will follow on separate report. Samples were analyzed by methods in SW-846, Test Methods for Evaluating Solid Waste, 1982.

A I L ENVIRONMENTAL SERVICES

Soren Christensen
Soren Christensen, Chemist

02/01/04

1773

DOCUMENT

#5

May 17, 1983

Mr. Herb Smiley
~~Menasha Corporation~~
 Box 155
 Otsego, Michigan 49078

Dear Mr. Smiley:

I have received and reviewed your proposal for closure of Menasha's spent liquor lagoons. The report was well prepared and presented adequate detail and information for evaluation. Based on the contents of Menasha's proposal, approval to proceed with the project is given. However, I want to caution you on one aspect of the project. The back pond is quite close to the Kalamazoo River. Special care should be taken during the closure of this pond to prevent breaching of the pond side wall between the pond and the river.

Please contact me at (517) 373-3710 if I can be of further assistance.

Sincerely,

Garth Aslakson
 Water Quality Specialist
 Surface Water Quality Division

amk

cc: Paul Blakeslee/SWQD File
Fred Morley/District File
 Galen Kilmer

M

PAPERBOARD DIVISION

MENASHA CORPORATION

Otsego Mill
P.O. Box 155
Otsego, MI 49078-0155
(616) 692-6141
FAX (616) 692-2060

PURCHASE ORDER MEN00135

THIS NUMBER MUST APPEAR
ON ALL PACKING LISTS AND INVOICES

P.O. NO. 5110005
P.O. DATE 07/22/94
P.O. PAGE 1

V
E
N
D
O
R

WESTERN MICHIGAN UNIV.
DEPT. OF ENV.
100 NORTH ZEEB
HOLLAND MI 49424-9261
TELEPHONE 616 941-2600

S
H
I
P
T
O

PAPERBOARD DIVISION
MENASHA CORPORATION
320 NORTH FARMER ST
OTSEGO MI 49078

940455

SHIP TO
CODE 00

BEST WAY

FOB OUR PLANT

NET 30

SALES
TAX YES

NEW

ACCOUNT
NUMBER 100-100-0010

B
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L
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T
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PAPERBOARD DIVISION
MENASHA CORPORATION
PO BOX 155
OTSEGO MI 49078

CONFIRM 55

ITEM NUMBER

DESCRIPTION

U/M

QUANTITY

DUE DATE

PRICE

TOTAL

100K SOIL

SAMPLE FROM THE
LIQUOR POND CLOSURE
SITE TO BE TESTED
FOR HAZARDOUS WASTE
DETERMINATION BY
TCLP EXCLUDING
PESTICIDES AND
HERBICIDES TESTS.

TOT

1

08/05/94

500.000

500.00

"For compliance with the OSHA standard on Hazard Communication, this purchase order requires that the vendor supply Material Safety Data Sheet(s) (MSDS) and warning labels on each and every different material listed. The "MSDS" is to be furnished with the order acknowledgement, the shipping papers and with the invoice. Any order not in compliance with this request is subject to rejection and/or delayed payment until the MSDS is received."

SPECIAL INSTRUCTIONS

THE U.C.C. (UNIFORM
COMMERCIAL CODE) OF MICHIGAN
APPLIES TO THIS PURCHASE
ORDER.

TO BE USED FOR

PAGE TOTAL

500.00

ADJUSTMENT

TAX

%

P.O. TOTAL

500.00

REQUISITIONED BY

AUTHORIZATION

REQUISITIONER

AERATION POND DESIGN

DOCUMENT #8

WHITE WATER TREATMENT PLANT

LAGOON SPECIFICATIONS

WHITE WATER TREATMENT PLANT

MEN00138

INDEX

Design Data	Table 1	4.
B.O.D. Reduction Chart and Horse Power Requirements	Table 2	.
Nutrient Feed System	Table 3	.
Lagoon Specifications	Appendix I	.
Aerators Specifications	Appendix II	.
Lagoon Details	Appendix III	.
Drawing 904-1		
Drawing 904-2		
Drawing 904-3		

TABLE I

WHITE WATER TREATMENT PLANTDESIGN DATAINFLUENT

White Water Flow, GPD	600,000	
B.O.D., lb/day	20,000 (a)	±
mg/l	4,000	
Suspended Solids, lb/1000 Gallons	2.0	.
Temperature, ° F.	130	
pH	6.0-7.0	
Total Solids, %	0.8	

SURGE AND SETTLING POND (Existing)

Capacity, Gallons	1,500,000	
-------------------	-----------	--

AERATION POND

Capacity, Gallons	8,250,000	
Retention Time, Days	13.7	
B.O.D., In, lb/day	20,000 (a)	
Out, lb/day	6,000	
Reduction, %	70	
Aeration Horsepower, (Nameplate)	400	

SETTLING PONDS

Capacity, Gallons	400,000	
Retention Time, day	0.7	
Suspended Solids, In, lb.	6,000	
Out, lb.	2,000	
B.O.D., In, lb/day	6,000	
Out, lb/day	4,000	
Reduction, %	80	
Temperature, ° F.	Ambient	
pH, Out	7.0-8.0	

(a) This is maximum design for influent B.O.D. Average influent is expected to be 15,000 lbs.

TABLE 2

WHITE WATER TREATMENT PLANTB.O.D. REDUCTION CHART AND HORSE POWER REQUIREMENTSB.O.D. REDUCTION CHART

<u>B.O.D. Remaining</u> (lbs)	<u>Day</u>
20,000	0
12,000	4
7,000	8
4,000	12
2,300	16

Data are based on an 80% B.O.D. reduction in 12 days with settling.

HORSE POWER REQUIREMENTS

	<u>Normal Capacity</u>	<u>Maximum Design</u>
B.O.D. Loading, lbs/day	15,000	20,000
Horse Power Required	260	347
Oxygen Demand, lbs./day	15,600	20,800
B.O.D. in Effluent, lbs/day	3,000	4,000

Factors: 1.3 lb. Oxygen/lb. B.O.D. Removed
2.5 lb. Oxygen/HP/Hour

WHITE WATER TREATMENT PLANTNUTRIENT FEED SYSTEM

A Nutrient Feed System will be installed to meter nitrogen and phosphorus compounds to the white water influent. The system is designed to feed five pounds of nitrogen and 1.0 pounds of phosphorus for every 100 pounds of B.O.D. loading. This system will consist of the following:

NITROGEN FEED SYSTEM: A 20,000 gallon storage tank for storing anhydrous ammonia and auxiliary feed and control equipment will be installed. Maximum usage rate will be 1,000 pounds of ammonia per day.

PHOSPHORUS FEED SYSTEM: A rubber-lined steel tank or plastic tank will be installed to store phosphoric acid. This tank will have a capacity of 10,000 gallons. The nutrients will be metered into the influent pipe line just before it enters the aeration pond.

EXCAVATION, GRADING AND SITE WORK1. General

- A. By way of general description, this Division includes the following major items: site clearing, excavation, construction of embankments, respreading of top soil and finish grading.
- B. Not included are such items as: excavation and backfill for installation of piping, concrete overflow boxes and manholes, seeding.

2. Soil Conditions

Soil borings were taken by Materials Testing Consultants, Inc., on March 26, 27, 28, 31 and April 1, 1969. The location and description of these borings have been reproduced and appear at the end of this Division.

3. Site Clearing

- A. Contractor shall remove from the areas within the grading limits all grass, brush, shrubs, trees, etc. Burn or remove this material from the site.
- B. All topsoil shall be stripped from all areas within the grading limits where embankments or cut sections occur. Stockpile this material on the site for reuse.

4. Excavation

- A. Excavate to the lines, elevations and grades shown to a tolerance of ± 0.2 feet. Allow for placement of stabilized gravel or concrete slope protection.

- B. All waste cut material is to be the property of the Owner. Dispose of this material at the Owner's directions.

5. Construction of Embankments

- A. Embankments shall be constructed to the lines and grades shown on the plans. The sandy material that is excess cut may be used for embankment construction.
- B. Compaction for all fill material placed in embankments shall be not less than 90% of maximum density at optimum moisture as determined by AASHO-T180, as outlined in the Field Manual of Soil Engineering. Fill shall be placed in layers. Tests shall be made where directed by the Engineer. Tests shall be made by an independent, approved testing laboratory. The cost of such tests will be borne by the Owner.
- C. The Contractor shall take particular note of the clayey material section required in the entire length of the south (river) side embankment. This clayey section shall be of the dimensions shown on the drawings, and shall have a Unified Soil Classification of GM-GG or SM-SC as shown on the sheets attached at the end of this section. The plasticity index shall be between 4 and 7. It shall be placed and compacted as described above.

6. Finish Grading

- A. Rough (machine) grade to uniform levels and slopes. Grades not otherwise shown shall be uniform levels or slopes between points shown or between points and existing finished grades which are to remain.

- B. Provide a firmly compacted base of stabilized gravel of 8" as shown on the plans. Stabilized gravel aggregate shall be equal to Michigan State Highway Department Specification 22A, Article 7.02 and 7.03.
- C. Place 4" of top soil on all slopes and surfaces of all embankments or cut sections where no concrete slope protection or stabilized gravel is shown. Seeding and fertilizing will be by the Owner.
- D. Rip-Rap shall be dumped along the river line of the south side of the south embankment as directed by the Owner or Engineer. Rip-Rap shall be stone or broken concrete pieces with a volume of not less than one (1) cubic foot. Least dimension of each piece shall be 6".

7. Miscellaneous Construction

- A. Furnish and install as shown on the drawings the 12 gauge guard rail, terminal sections, and wood posts. Guard rail shall be shop prime painted and field finish painted with one coat of an approved rust inhibitive paint.

CONCRETE WORK1. General

- A. All reinforced and unreinforced concrete, including reinforcing steel, which is poured at the site is included in this Division.
- B. Also included in this section are stop log grooves, wood, and manhole covers.
- C. Sleeves or PVC flanges for pipe will be furnished by others, but installed by this Contractor.

2. Materials

- A. Portland Cement: ASTM C150, type I.
- B. Coarse Aggregate: Limestone, in accordance with ASTM C33, except a total of 3% deleterious material will be acceptable.
- C. Sand: Clean, hard, durable, uncoated grains free from silt, loam, or clay. Sharp and adequately graded.
- D. Water: Clean and potable.
- E. Air Entrainment: In accordance with ASTM C260.

3. Forms

- A. Forms shall conform to the shape, levels, lines and dimensions shown on the drawings, shall be substantially constructed and braced, and shall be sufficiently tight to prevent mortar leakage.
- B. Walls shall be formed of Douglas Fir (form grade) plywood contact surfaces or smooth metal forms. Form ties may be used if in accordance with manufacturer's recommendations.

- C. Forms, their braces and supports shall be removed such as to insure the complete safety of the structure. Wall forms shall not be removed, in any case, in less than four (4) days. After formwork is removed, point and patch pockets, holes and tie depressions.

4. Concrete

- A. Ready-mixed in accordance with ASTM C94.
- B. Air Entrainment: All concrete shall be air entrained to provide $6-1/2\% \pm 1-1/2\%$ entrained air.
- C. Slump: Maximum slump for overflow boxes and manholes shall not exceed 5 inches. For slope protection, maximum slump shall be 3 inches.
- D. Overflow boxes and manholes: 3000 psi minimum compressive strength and shall contain not less than 5-1/2 sacks of cement per cubic yard. Slope protection concrete: minimum 4 sacks of cement per cubic yard.

5. Tests

- A. Contractor shall furnish and pay for a reasonable number of tests of concrete strength and slump.
- B. One test (two standard cylinders and a slump determination) shall be taken from significant pours of structural concrete. Testing slope protection concrete will not be required.
- C. Sampling, storing and testing shall be made in accordance with applicable ASTM procedures.
- D. Testing shall be done by an independent testing laboratory. One copy of all test results shall be sent directly to the Engineer.

6. Placing Concrete

- A. Place in accordance with good area practice to prevent segregation of aggregate, form damage, any additional water, any dusting with cement, re-vibration, lateral placement using vibrators, uneven placement in walls, cold joints, etc.
- B. Mechanical vibration equipment, or other approved means, shall be used to thoroughly consolidate the concrete, completely embed reinforcement, and to prevent cavities and honeycombing. Vibration time shall be limited to prevent segregation.
- C. Cold weather shall require that the ready-mix temperature, at the job site shall be between 55° and 85° F. After placement, the concrete shall be maintained at not less than 70° F. for three (3) days or 50° F. for five (5) days. Cooling of concrete afterwards shall not be faster than 1 degree F. per hour for 24 hours and 2° F. per hour thereafter. Carbon dioxide shall be vented away from green concrete work.
- D. Hot weather shall require wetting forms and continuous dampening with an approved curing compound and curing procedure to prevent drying of the surface for at least 3 days.

7. Reinforcing Steel

All reinforcing steel shall be ASTM A615, grade 40, furnished and placed in conformance with ACI 301, Chapter 5.

8. Miscellaneous Items

- A. Waterstop: W.R. Meadows Type No. 4316 PVC waterstop or approved equal.
- B. Stop Log Grooves: Type 304 stainless steel, 1/4" thick, dimensions as shown on the drawings.

- C. Wood stop log planks: Heart face select and better cypress. Dress
to 3-3/4".
- D. Manholes Covers and Frames: East Jordan #2920, or approved equal.

OVERFLOW PIPES AND VALVES1. General

- A. By way of general description, this Division includes all labor, materials, and equipment necessary for completion of the overflow piping, including valves, fittings, and excavation and backfill for same.
- B. Not included are: excavation and backfill for embankment construction, manhole covers and frames, lagoon influent line piping (by Owner).

2. Pipe and Materials

- A. All overflow piping shall be with Colonial 12" schedule 40 PVC pipe with .406 wall thickness. Flanges, for connections to fittings and valves, shall be PVC, standard ASA drilling, solvent welded to pipe in conformance with manufacturer's recommendations. Pipe sections shall be belled and solvent welded where connected in conformance with manufacturer's recommendations.
- B. Fittings for PVC pipe shall be Type 316 stainless steel, heavy coated on the exterior with a bituminous material as recommended by the manufacturer.
- C. Corrugated metal pipe sleeves, where shown on the drawings, shall be 18", 14 gauge, galvanized and full coated.
- D. Steel Pipe: 12" schedule 40, ASTM A120, complete with fittings as necessary.
- E. Valves: Fabri-Valve Company of America, Fig. 141, 12" Wafer Bonnetless Stock Valve. Provide support for valves in manholes where shown on the drawings.

3. Excavation and Backfill

A. Trenching for all underground pipe lines shall be excavated to the required depths. Trenching in the vicinity of embankments shall be done after the earth embankment construction is complete. The bottom of trenches shall be tamped hard and graded to secure the required fall. Bell holes shall be excavated so that the pipe will rest on solid ground for its entire length. This Contractor will repair all damage and remove all earth resulting from cave-ins. Backfill as soon as possible after laying pipe. Tamp earth for a depth of at least one foot above pipe top. No building rubble or debris shall be used for backfilling. There shall be a minimum of one foot of earth surrounding all PVC pipe. Extreme care shall be taken in handling and installing PVC pipe to avoid breakage. Where PVC pipe is not encased in corrugated metal pipe, mark location of pipe so that vehicles may not drive over the pipe.

4. Workmanship

All materials and equipment shall be installed and completed in a first class workmanlike manner. Installation of all pipe and materials shall be in strict accordance with manufacturers' recommendations and specifications.

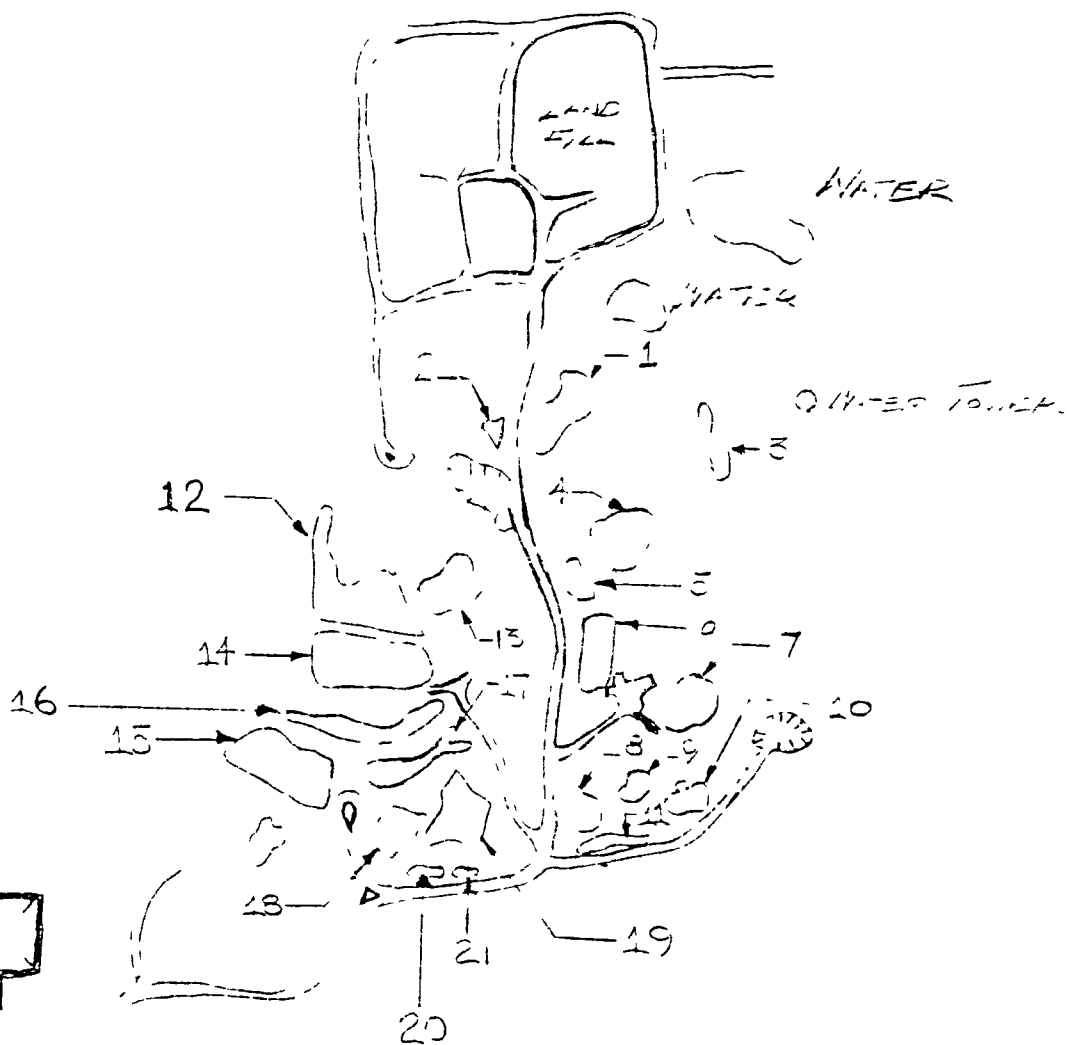
HISTORY OF SLUDGE AND LIQUOR PONDS NORTH OF RIVER ROAD

DOCUMENT #9

The sludge ponds came into use in the early 1970's, shortly after the #1 clarifier was constructed. The first ponds were natural depressions in the terrain. As the need arose, several ponds were dug. In the 1980's some of the ponds were used for storage of liquor solids when storage became short.

In 1984 the decision was made to construct containment structures for both liquor and sludge. A planned closure of the ponds took place from 1983 to 1986. Much of the liquor was used as impervious cap for the on-site landfill. The sludge was sprayed onto the surrounding area as fertilizer for reconstructive growth.

The liquor and sludge solids were tested for various parameters. It is not expected that PCB's would be found in either by-product.



MENASHA CORPORATION

PAPERBOARD DIVISION

OTSEGO MICHIGAN

DRAWING NUMBER

2352



MENASHA CORPORATION

PAPERBOARD GROUP

October 19, 1983

Gaylyn Kilmore
MDNR
Ground Water Division
621 10th. Street
Plainwell, MI 49080

Dear Mr. Kilmore,


Attached for your review and approval is a copy of our plan for the closure of the unlined waste water sludge ponds. Basically, the plan is to relocate the existing ponds, recontour the area and use the sludge on the recontoured area to build up the humus in the soil. The area would be shaped to provide a well-draining finished grade. The resulting slope will be seeded to grass.

The closure of the sludge ponds will push us very near compliance with Part 22 of the Ground Water Quality Rules.

Please feel free to contact me if you have any questions.

Sincerely,

MENASHA CORPORATION


Herb Smiley
Project Engineer

S E C T I O N ASCOPE OF THE PROJECT

The project as proposed by Menasha Corporation consists of three phases:

First Phase:

The first phase is to be complete before the end of 1983. It involves relocating the volume of (11) ponds to (3) existing ponds. The area would be recontoured and protected from erosion.

Second Phase:

The second phase would be complete in 1984. It consists of spreading the sludge on the recontoured area. As the remaining ponds are emptied, they will be filled in and sludge will also be applied to these areas. Once the sludge ponds are closed, the area will be seeded to grass.

Third Phase:

The third phase will also be completed in 1984, in conjunction with the second phase. It will address the two mixed content ponds. Further study of the area will be required before a formal proposal will be presented on the closure of ponds.

NATURE OF EXISTING FACILITIES

Sludge storage is presently accomplished in (22) separate unlined earthen basins randomly spotted on a gradually sloping hillside northeast of the mill.

A survey of the ponds (copy attached as Appendix A) shows total pond area of 314,000 square feet (7.2 acres), containing a total sludge volume of 7.2 million gallons. All but two of the ponds contain sludge from the mill wastewater treatment plant. Two of the ponds (#2 and #12) having a total area of 0.7 acres contain 2.3 million gallons of a sludge mixture which includes material removed from ash ponds and the mill's liquor ponds, in addition to wastewater sludges.

The wastewater sludges are applied to agricultural land as a routine practice. Storage in the ponds normally occurs during winter periods.

The material in ponds #2 and #12 are not suitable for land application, and alternative management methods must be identified for the contents of the ponds.

PROPOSED REMEDY

The sludge pond closures will be conducted in three phases. The first phase will be accomplished yet this year. We are proposing to empty sludge ponds #4, #5, #8, #9, #10 and #11 into sludge ponds #6 and #7; and #16, #17, #19, #20 and #21 into sludge pond #18.

The sludge will be pumped from pond to pond. There may be very thick sludge in the bottom of the ponds, and our plans are to bury the sludge in-place. The ground water flow and the mill plant wells are located such that a small amount of sludge remaining in the bottom of the pond will have no effect on the ground water in the surrounding area (Appendix B).

The ponds were created for the most part by constructing dikes along naturally sloping terrain features to create the impoundments. It is planned that the dikes will be removed with earth-moving equipment after the ponds are emptied. The terrain will then be reshaped to a gentle slope.

The second phase of the project will be started in the early part of 1984. The remaining sludge ponds, #2, #6, #7, #13, #14, #15 and #18, will be used to build the humus in the recontoured area. The sludge will be spray-applied throughout the year. If possible, the sludge will be disked into the soil. As the ponds are emptied, they will be shaped to provide a well-draining finished grade.

Once the ponds are emptied, the area will be shaped with sufficient overfill to allow for at least 10% settlement to prevent ponding. The resulting slopes will be seeded to grass. Regular inspections will be conducted thereafter to identify any areas of ponding or "potholes", which will be reshaped if needed.

The third phase of the project involves the closure of ponds #2 and #12. Developing a closure plan for these ponds will involve more field decisions because the contents are a nonhomogeneous mixture which is not suitable for land application. We will study this closure in depth and present a closure plan in 1984.

A P P E N D I X BGROUNDWATER FLOW AND WELL LOCATION

The following information is taken from the "Sanitary Landfill Hydrogeologic Investigate" study for Menasha by CH2M Hill, April 1981.

GROUNDWATER OCCURRENCE AND MOVEMENT

Beneath the landfill site area, groundwater occurs within the pore spaces of the sediments comprising the glacial deposits. Below the water table, the pores are completely saturated. Above the water table in the unsaturated zone the pore spaces are only partially filled with water. Within this zone the direction of groundwater movement is essentially downward. However, the downward percolation of water may locally be impeded or the direction altered by small impermeable lenses of glacial till or clay. Beneath the water table groundwater follows the hydraulic gradient from areas of high groundwater elevation to areas of lower groundwater elevation.

The bedrock ridge appears to extend to a high enough elevation so it does not have free groundwater occurring on top of it.

Figure 7 is a portion of the USGS Otsego Quadrangle which shows the area's general topography. We have depicted the trend of this bedrock ridge as probably being toward the dam site on the river (see Figure 7), but this is only inferred. Figures 8, 9, and 10 present topographic cross sections that illustrate the relationship of the landfill to the area's topography. Locations of the sections are presented in Figure 7.

Based on the water level data gathered to date, the groundwater flow direction appears to be to the west-southwest in the area of the site. This localized condition beneath the site is probably caused by the bedrock ridge which does not allow the regional table to flow directly toward the river as the topographic cross sections and the position of the Kalamazoo River with respect to the landfill would suggest.

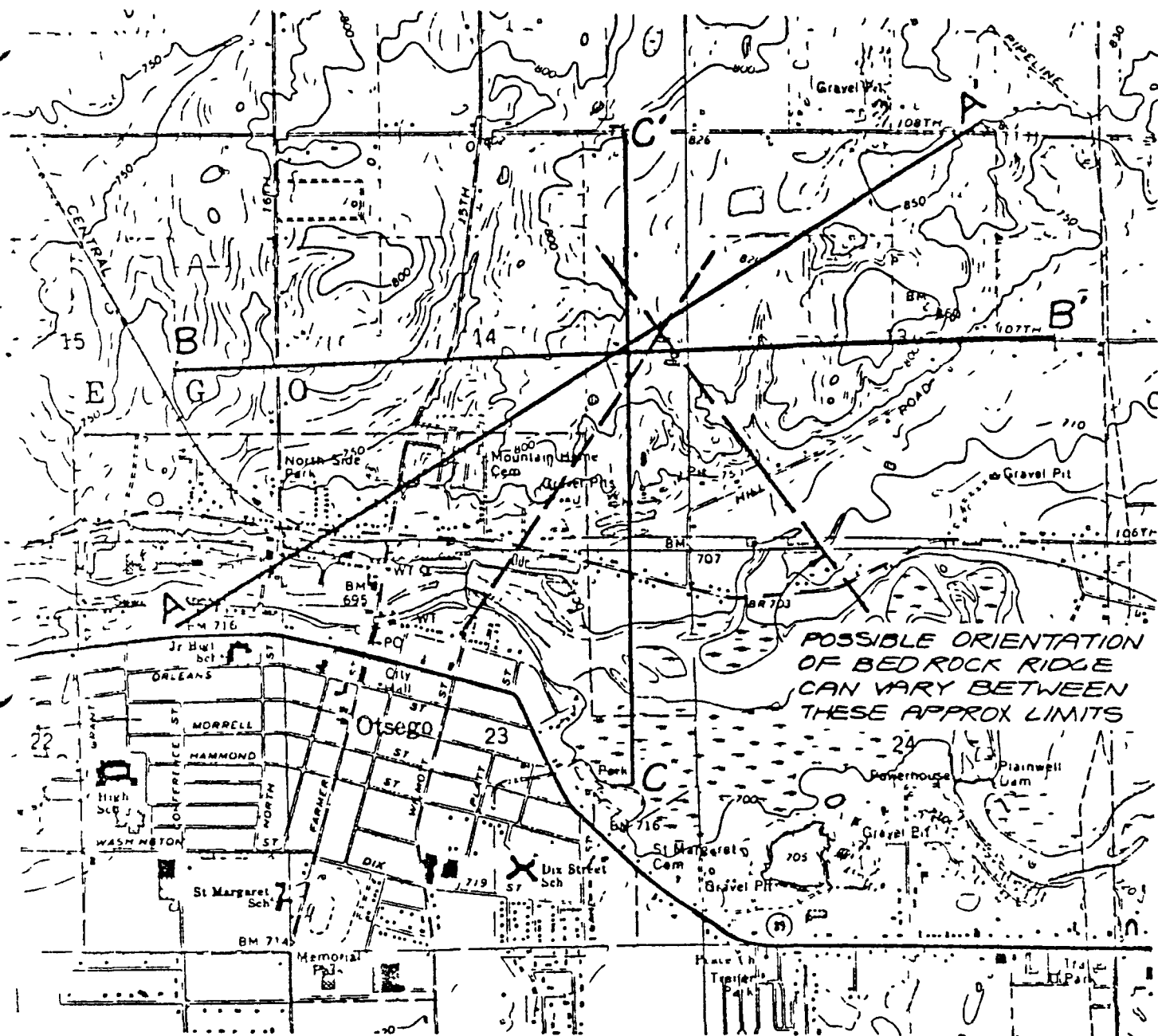


FIGURE 7 SECTION LOCATIONS

APPLICATION FOR PERMIT

MEN00160

Corps of Engineers
Department of the Army

Corps Process No.

State of Michigan
Department of Natural Resources
Land Resource Programs

DNR File No.

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT THIS APPLICATION — PRINT OR TYPE

1. APPLICANT (individual or corporate name) <u>Menasha Corp.</u>		AGENT/CONTRACTOR (firm name if known)	
ADDRESS <u>320 N. Farmer St.</u>		ADDRESS	
CITY <u>Otsego Michigan</u>	STATE <u>MI</u>	CITY	STATE
TELEPHONE (Work) <u>616-672-0141</u> (Home)	SOC. SECURITY or FED. ID No. <u>39-0464-680</u>	TELEPHONE	

2. If applicant is not owner of the property where the proposed activity will be conducted, provide name and address of owner and include letter of authorization from owner:

OWNER'S NAME	MAILING ADDRESS	CITY	STATE	ZIP
--------------	-----------------	------	-------	-----

3. PROJECT LOCATION		Street/Road <u>106 St.</u>	Village/City <u>Otsego</u>	BODY OF WATER (Lake, stream, creek, pond, or drain) <u>Gun River.</u>	
County <u>Alcona</u>	Township <u>Otsego</u>	Town <u>Otsego</u>	Range <u>12W</u>	Section(s) <u>14</u>	Subdivision or Plat <u>SE 1/4</u>

4. PROJECT INFORMATION

- (a) Describe proposed activity
Install 400 ft of Private Drain from an existing Stormwater Collection basin to 300 ft of New County Drain that must be installed along the West Side of Hill Road. The existing County Drain goes to the Gun River.
- (b) Attach drawings of the proposed activity prepared in accordance with the DRAWING REQUIREMENTS on pages 1 & 2 of Instructions.
- (c) Check appropriate Project Type (below) See Samples of Drawings Required

- 1) ☒ Dredging, Filling, Draining or Construction Work in Inland Lakes or Streams, Great Lakes Bottomlands or Wetland Areas 1, 2, 3, 4, or 5
- 2) ☐ Work in Riverine Flood Plain (See SPECIAL INSTRUCTIONS, Section 1, on back of this form) 6
- 3) ☐ New or Replacement Bridge or Culvert (See SPECIAL INSTRUCTIONS, Section 2, on back of this form) 7, 8, 9 and 10
- 4) ☐ Dam Construction or Reconstruction (See SPECIAL INSTRUCTIONS, Section 3, on back of this form) 11
- NOTE: If boxes 2, 3 and/or 4, above, are checked provide appropriate additional information on the back under "SPECIAL INSTRUCTIONS"

- (d) PROPOSED USE: 1. ☐ Public; ☒ Private; ☐ Commercial; ☐ Other (specify) _____
- (Check appropriate box) 2. Will the project site be served by a new on-site Sewage Disposal System (Septic Tank) ☒ No ☐ Yes

- (e) Location of Source of Fill if more the 50 cubic yards are required for other than commercial source:
- | | | | | | |
|----------------------------|----------|------|-------|---------|-------------|
| County | Township | Town | Range | Section | 1/4 Section |
| <u>No Fill is Required</u> | | | | | |
- Further Description (provide vicinity map of Source Site (Sample Drawing 5) if more than 50 cubic yards and source is other than commercial)

- (f) Dredge Spoils Disposal Location Site (if required).
- | | | | | | |
|---------------|---------------|-----------|------------|-----------|---------------|
| County | Township | Town | Range | Section | 1/4 Section |
| <u>Alcona</u> | <u>Otsego</u> | <u>1N</u> | <u>12W</u> | <u>14</u> | <u>SE 1/4</u> |
- Further Description (provide vicinity map for Disposal Site (Sample Drawing 3))

- Dredge Spoils will be used to Construct the Down Hill Side of the Drain wall on Menasha's Property and to fill in Low spots along the County Drain.
- (g) Describe any project alternatives considered: The County will Construct the Drain along Hill Road and dispose of ~ 350 cu yd.

- If fill is required, is project water dependent? ☒ No ☐ Yes
- (h) Date activity will commence if permit is issued 1 Aug 86; be completed 31 Oct 86
- (i) Is any portion of the requested project now complete? ☒ No ☐ Yes. If yes, identify the completed portion on the drawings you submit and give the date activity was completed.

DO NOT WRITE IN THIS SPACE — FOR CASHIER USE ONLY

APPLICATION CONTINUED ON
REVERSE SIDE.

REMOVE INSTRUCTIONS BEFORE MAILING

PR 27:
Rev. 8/

DO NOT REMOVE THIS STUB

APPLICATION FOR PERMIT
LAND RESOURCE PROGRAMS

(APPLICANT COMPLETE THE FOLLOWING)

NAME OF REMITTER <u>Menasha Corporation</u>
ADDRESS <u>320 N. Farmer St., Otsego, Mich 49078-0155</u>
<input type="checkbox"/> 1972 P.A. 346 Permit Application Fee <input type="checkbox"/> 1979 P.A. 203 Permit Application Fee

2310

PR
Rev.

5 State why you believe the project will not cause pollution, impair or destroy the water or any natural resource.
The Hill side being Drained will have a cover growth on it before the drain is installed and the collection Basin will allow most suspended solids to settle out before the stormwater goes to the Gun River.

6 List all other Federal, State or local governmental agency permits or certifications required for proposed project.

Specify permit approvals or denials already received. Explain reasons for denials.

Agency Type Approval Identification No. Date Applied Date Approved/Denied

DNR

NPPES.

County Drain Commission - Earth change.

11/22/95.

State reasons if permit denied

7. Is there any present litigation involving the subject property? ☒ No ☐ Yes If "Yes", explain:

8 Adjoining Riparian (Neighboring Waterfront Property Owner) Name and mailing address at which they may be reached

Name of Riparian #1	Address	City	State	ZIP
Harry Steinberg	1391 Hill Road	Otsego	MI	49068
Name of Riparian #2	Address	City	State	ZIP
Conrail	882 Hynes Ave. SE	Grand Rapids	MI	49503
Name and Address of Lake Association	Address	City	State	ZIP
Kenneth Kling	1381 Hill Road	Otsego	MI	49078

READ CAREFULLY BEFORE SIGNING.

9 Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in this application and that to the best of my knowledge and belief such information is true and accurate and in compliance with the State Coastal Zone Management Program. I certify that I have the authority to undertake the activities proposed in the application. By signing this application, I understand to allow representatives of the Michigan Department of Natural Resources and the U.S. Corps of Engineers to enter upon said property in order to inspect the proposed project. I understand that the granting of other permits by local, county, state or federal agencies does not release me from the requirements of obtaining the permit requested hereon before commencing the project. I understand that the payment of fee does not guarantee permit.

SIGNATURE

John R. Blawie P.E.

DATE

11/10/96

SPECIAL INSTRUCTIONS

SECTION 1. FOR WORK IN FLOODWAY AREAS, a hydraulic engineering report prepared by a Registered Professional Engineer showing the impact of the proposal on flood stage or discharge characteristics may be needed.

SECTION 2. FOR NEW OR REPLACEMENT BRIDGES OR CULVERTS. To assist in the selection of an appropriate size structure, a design discharge may be requested from the Department of Natural Resources, Water Management Division. Requests should be accompanied by a location description giving the town, range, section, stream and road name. A location map as illustrated on page 4, Sample Drawing 11, should be included with the submission.

STRUCTURAL DATA:

Existing

PROPOSED (replacement)

Type	_____	_____
Entrance Design	_____	_____
Span, Rise	_____	_____
Length (width)	_____	_____
Waterway Area (total)	_____	_____

ELEVATIONS: (Bench Mark Datum)

Low Steel (culvert crown)	upstr _____ dnstr _____	upstr _____ dnstr _____
Invert	upstr _____ dnstr _____	upstr _____ dnstr _____
Highwater (observed or recorded)	_____	_____

ROAD GRADES

EXISTING

PROPOSED

At structure	_____	_____
Low Point of Approach	_____	_____

SECTION 3. DAM CONSTRUCTION OR RECONSTRUCTION, COMPLETE THE FOLLOWING:

Proposed head _____ ft. (Difference between normal pond level and stream water surface level below dam).

Proposed impoundment size (flooded area) _____

If the proposed dam project has a head of five(5) feet or more or impounds five (5) or more surface acres, compliance with the Dam Construction Approval Act is required. Following a review of the environmental impacts of the proposed dam construction and clearance for the issuance of an Inland Lake and Streams Act Permit, you will be notified of the need to submit construction plans and specifications, prepared by a Registered Professional Engineer. Also, at that time you will be notified that an additional fee will be required in accordance with the following schedule:

Head less than five (5) feet ... No Fee Head greater than five (5) feet but less than eight (8) feet ... \$200.00
 Head greater than eight (8) feet but less than 20 feet ... \$400.00 Head greater than 20 feet ... \$600.00

APPLICATION AND PERMIT

MEN00162

CRA100 Rev 5/86

Permit Number

150

Issuance Date

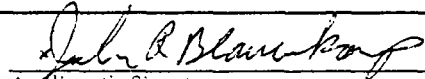
10/22/86

to construct, operate, maintain
use and/or remove within a county
road right-of-way

BOARD OF COUNTY ROAD COMMISSIONERS of ALLEGAN County, Michigan
ADDRESS: 1308 Lincoln Road, Allegan, MI 49010
PHONE: (616) 673-2184

If applicant hires a contractor to perform the work, BOTH must complete this form and BOTH assume responsibility for the provisions of this Application and Permit.

APPLICANT	CONTRACTOR
NAME: <u>Menasha Corporation</u>	NAME: <u>Engel Construction</u>
MAILING ADDRESS: <u>P.O. Box 155</u> <u>Otsego, MI 49078</u>	MAILING ADDRESS: _____ <u>Kalamazoo, MI</u>
TELEPHONE NO. _____	TELEPHONE NO. _____

 Applicant's Signature Title <u>Corp. Env. Manager</u> Date: <u>10/22/86</u>	Contractor's Signature Title _____ Date: _____
---	---

FINANCIAL REQUIREMENTS	ATTACHMENTS REQUIRED
Application Fee \$ _____	Plans and Specs. _____
Permit Fee \$ _____	Bond _____
Est. Inspect. Fee \$ _____	Proof of Insurance _____
Bond \$ _____	Yes _____ No _____
Deposit \$ _____	P.I. \$ _____ P.D. \$ _____
Other \$ _____	Other _____
To Be Billed \$ _____	
Receipt Number _____	
Dated _____	

APPLICATION

Applicant and/or Contractor request a Permit for the purpose indicated in the attached plans and specifications at the following location:

CITY _____ / or TOWNSHIP Otsego SECTION 13 & 14

NAME OF ROAD Hill Road between 106th and _____

for a period beginning 10-22-86 and ending 10-24-86

and agrees to the terms of the permit.

Clean out road side ditch on Hill Road North of 106th Ave. just north of
Railroad tracks on west side of road. Excavated material to be hauled to
other Menasha property.

PERMIT

A permit is granted in accordance with the foregoing application for the period stated above, subject to the following terms agreed to by the Permit Holder. When Applicant hires a Contractor the "Permit Holder" is the Applicant and the Contractor.

RECOMMENDED FOR ISSUANCE:

BOARD OF COUNTY ROAD COMMISSIONERS
Allegan COUNTY, MICHIGAN

By _____

By _____

By _____

Investigator

Date _____ Title _____

2332

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

MEN00163

PERMIT

Permit No. 85-12-437
Date Issued July 7, 1986
Extended _____
Revised _____
Expires December 31, 1987

I
S
S
U
E
D
T
O
L

Menasha Corporation
320 North Farmer Street
Otsego, Michigan 49078

- This permit is granted under provisions of:
- ☒ The Inland Lakes and Streams Act, 1972 P.A. 346, as amended.
 - ☐ The Great Lakes Submerged Lands Act, 1955 P.A. 247, as amended.
 - ☐ Flood Plain Regulatory Act, 1929 P.A. 245, as amended.
 - ☐ The Goemaere-Anderson Wetland Protection Act, 1979 P.A. 203.

Permitted Activity

Construct a private drainage ditch 400 feet in length, placing all spoils on upland areas. No spoils are authorized to be placed in wetlands.

Water Course Affected	County	Town	Range	Sect.	Sub. and Lot Number
Gun River	Allegan	1N	12W	14	106th St., Otsego

Authority granted by this permit is subject to the following limitations:

- A Initiation of any work on the permitted project confirms the permittee's acceptance and agreement to comply with all terms and conditions of this permit
- B The permittee in exercising the authority granted by this permit shall not cause unlawful pollution as defined by Act No. 245 of the Public Acts of 1929 as amended
- C This permit shall be kept at the site of the work and available for inspection at all times during the duration of the project or until its date of expiration
- D All work shall be completed in accordance with the plans and specifications submitted with the application and/or plans and specifications attached hereto
- E No attempt shall be made by the permittee to forbid the full and free use by the public of public waters at or adjacent to the structure or work approved herein
- F It is made a requirement of this permit that the permittee give notice to public utilities in accordance with Act 53 of the Public Acts of 1974 and comply with each of the requirements of that act
- G This permit does not convey property rights in either real estate or material, nor does it authorize any injury to private property or invasion of public or private rights, nor does it waive the necessity of seeking federal assent, all local permits or complying with other state statutes
- H This permit does not prejudice or limit the right of a riparian owner or other person to institute proceedings in any circuit court of this state when necessary to protect his rights
- I Permittee shall notify the Department of Natural Resources within one week after the completion of the activity authorized by this permit by completing and forwarding the attached preaddressed post card to the office addressed thereon
- J This permit shall not be assigned or transferred without the written approval of the Department of Natural Resources
- K Work to be done under authority of this permit is further subject to the following special instructions and specifications:

All dredge spoils including organic and inorganic soils, vegetation and debris shall be placed above the ordinary high water mark, leveled and stabilized with sod and/or seed, fertilizer and mulched, in such a manner as not to erode into any waterbody, wetland or floodplain.

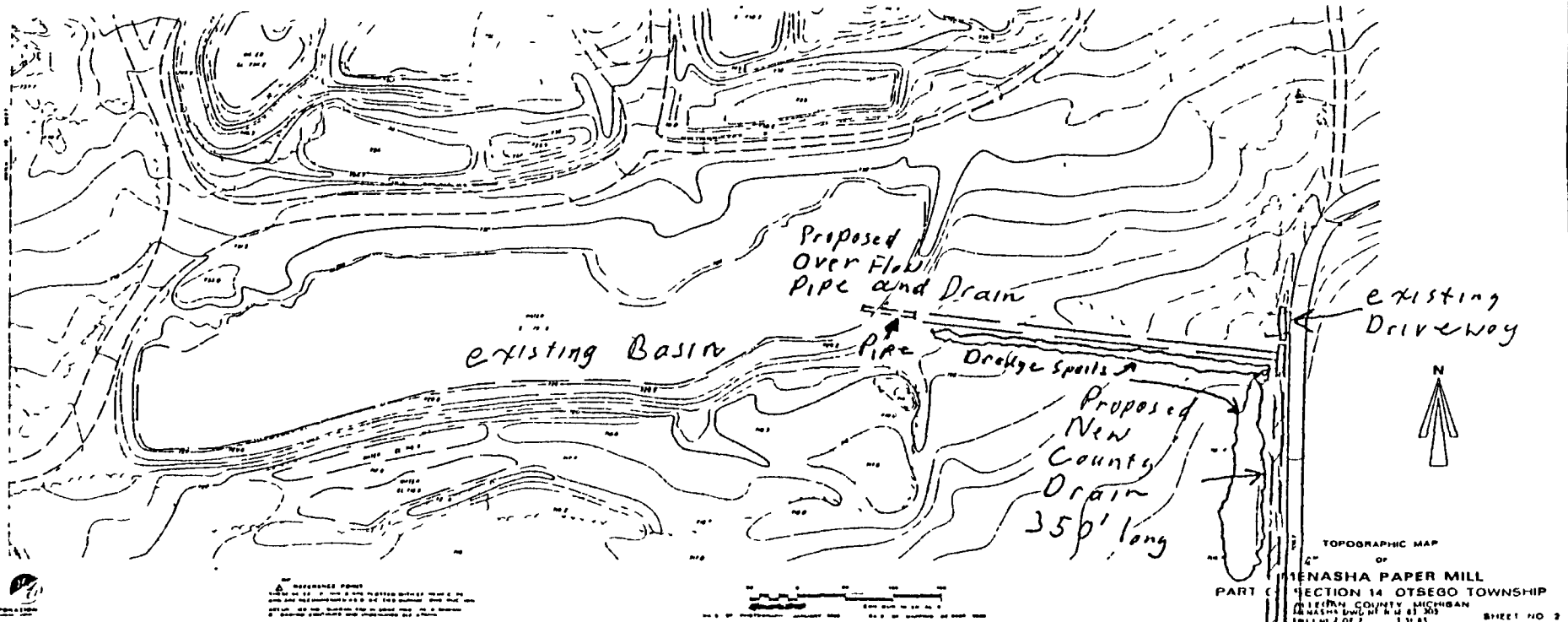
Authority granted by this permit does not waive permit requirements under the Soil Erosion and Sedimentation Control Act, Public Act 347, or the need to acquire applicable permits from the County Drain Commission. Contact Lynn Fleming, Allegan County Drain Commissioner, 108 Chestnut St., County Building Annex, Allegan, MI 49010, phone 616-673-8471.

cc: DLRP, Lansing
D-12 Law
Allegan CEA (Fleming)
City of Otsego
Otsego Twp.

GORDON E. GUYER
Director, Department of Natural Resources

By

Jeffery A. King
Jeffery A. King



Rail Road Tracks

Tube Under Tracks

Drain To Gun River

Tube

Hill Road

106th Avenue

Menasha Corp
Gun River.
Otsego, Mich
Otsego township
All...

Proposed
Drain to
Gun Riv

P.A. 347**PERMIT**

#620

Expiration Date: 9-30-86Lot # Sec. 14 Name: Menasha Corporation

A & L GREAT LAKES AGRICULTURAL LABORATORIES, INC.

5011 Decatur Road • Fort Wayne, Indiana 46806-3085 • Phone: (219) 456-3545

MEN00166

**WATER ANALYSIS**REPORT NUMBER
F210-63ACUSTOMER #
59013SEND TO:
MENASHA CORP-SLUDGE PROJ
AL SWITZENBERG
P.O. BOX 155
OTSEGO MI 49078ATTENTION:

COPY TO:RE:
MENASHA CORP.

DATE: 08/01/86 PAGE: 1

SAMPLE ID: OVERFLOW POND
LABORATORY #: W07058

REQUESTED ANALYSIS	VALUE	UNIT
Copper (Cu)	**	ppm
Zinc (Zn)	***	ppm
Cadmium (Cd)	**	ppm
Chromium (Cr)	*	ppm
Lead (Pb)	****	ppm
Nickel (Ni)	****	ppm
Mercury	*****	ppb

COMMENT: * Below detectable limit of 1 ppm.
** Below detectable limit of 0.1 ppm.
*** Below detectable limit of 0.02 ppm.
**** Below detectable limit of 0.5 ppm.
***** Below detectable limit of 0.5 ppb.

Test Results
Sludge Pond Closure
Ground Water 48



PREIN & NEWHOF, P.C.
ENGINEERS — SURVEYORS
ENVIRONMENTAL & SOILS LABORATORIES
 3000 EAST BELT LINE N E , GRAND RAPIDS, MICHIGAN 49505
 285 JAMES STREET, SUITE E, HOLLAND, MICHIGAN 49423

TELEPHONE (616) 364-8491
 TELEPHONE (616) 399-9218

H EDWARD PREIN PE RLS
 THOMAS NEWHOF PE
 WILSON D McQUEEN PE
 LARRY D WILSON PE
 MICHAEL S FULLER PE
 PHILIP C GLUPKER PE
 JAMES A COOK PE
 ROBERT J VANDER MALE PE
 ROBERT J REIMINK PE
 RICHARD L SERBOWICZ PE
 ARTHUR W BRINTNALL RLS
 REX A MILLIRON RLS

September 3, 1986
 77129

Mr. John Bonham
 Menasha Corporation
 P O Box 155
 Otsego, Michigan 49078

RE: Sample Liquor Sludge 8/5/86, received 8/8/86

LABORATORY RESULTS

I. EP Toxicity Leachate Concentrations

Final pH	5.1
Arsenic, mg/L	0.010
Barium, mg/L	1.8
Cadmium, mg/L	0.840
Chromium, mg/L	0.10
Copper, mg/L	0.09
Lead, mg/L	< 0.03
Mercury, mg/L	0.0040
Selenium, mg/L	< 0.005
Silver, mg/L	0.09
Zinc, mg/L	1.74

II. Total Cyanide, mg/kg < 0.02

III. Volatile Organics Scans 601, 602: None detected, < 1 mg/kg

PREIN & NEWHOF

Jane Hoch
 Jane Hoch
 Chemist



PREIN & NEWHOF, P.C.
ENGINEERS — SURVEYORS
ENVIRONMENTAL & SOILS LABORATORIES
3000 EAST BELT LINE N.E., GRAND RAPIDS, MICHIGAN 49505
285 JAMES STREET, SUITE E, HOLLAND, MICHIGAN 49423

MEN00169

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PHILIP C GLUPKER PE
JAMES A COOK PE
ROBERT J VANDER MALE PE
ROBERT J REIMINK PE
RICHARD L SERBOWICZ PE
ARTHUR W BRINTNALL RLS
REX A MILLIRON RLS

September 3, 1986
77129

Mr. John Bonham
Menasha Corporation
P O Box 155
Otsego, Michigan 49078

RE: Sample #1, Water Pond #1- 8/5/86, Received 8/8/86

LABORATORY RESULTS

I. EP Toxicity Leachate Concentrations

Final pH	4.9
Arsenic, mg/L	<0.005
Barium, mg/L	0.4
Cadmium, mg/L	0.015
Chromium, mg/L	0.04
Copper, mg/L	<0.03
Lead, mg/L	<0.03
Mercury, mg/L	0.0070
Selenium, mg/L	<0.005
Silver, mg/L	<0.02
Zinc, mg/L	0.238

II. Total Cyanide, mg/kg <0.2

III. Total Organics Scans 601,602: None detected <1 mg/kg

PREIN & NEWHOF

Jane Hoch
Jane Hoch
Chemist



PREIN & NEWHOF, P.C.
ENGINEERS — SURVEYORS
ENVIRONMENTAL & SOILS LABORATORIES
3000 EAST BELT LINE N.E., GRAND RAPIDS, MICHIGAN 49505
285 JAMES STREET, SUITE E, HOLLAND, MICHIGAN 49423

MEN00170

TELEPHONE (616) 364-8491
TELEPHONE (616) 399-9218

H. EDWARD PREIN P.E., R.L.S.
THOMAS NEWHOF P.E.
WILSON D. McQUEEN P.E.
LARRY D. WILSON P.E.
MICHAEL S. FULLER P.E.
PHILIP C. GLUPKER P.E.
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ROBERT J. VANDER MALE P.E.
ROBERT J. REIMINK P.E.
RICHARD L. SERBOWICZ P.E.
ARTHUR W. BRINTNALL R.L.S.
REX A. MILLIRON R.L.S.

September 3, 1986
77129

Mr. John Bonham
Menasha Corporation
P O Box 155
Otsego, Michigan 49078

RE: Overflow Pond, 7/31/86 received 8/8/86
% Solids in Sample: 0.3%

LABORATORY RESULTS

I. EP Toxicity Leachate Concentrations

Arsenic, mg/L	0.005
Barium, mg/L	< 0.1
Cadmium, mg/L	0.005
Chromium, mg/L	< 0.04
Copper, mg/L	< 0.03
Lead, mg/L	< 0.03
Mercury, mg/L	0.0060
Selenium, mg/L	< 0.005
Silver, mg/L	< 0.02
Zinc, mg/L	0.248

II. Total Cyanide, mg/L < 0.005

III. Volatile Organics Scans 601,602: None detected, < 1 ug/L

PREIN & NEWHOF

Jane Hoch
Jane Hoch
Chemist

Lab Log #1254

2205

3-12-8

MEN00171

SLUDGE PONDS

2860 Dry Tons

KNOWN

Sludge Volume: 17,152,000 gallons at 4% solids - Spraying

Consistency

20 Acres of available land (Menasha). 30 Acres

1 Acre can handle 25 ton per season.

Hauling cost 1-1/2¢ per gallon (Menasha).

No MDNR mandate for closure/land application.

Hauling outside is 2¢ per gallon (Minimum).

Wet summer - No spraying.

Capital equipment cost: \$30,000 for spraying.

1 Truck can haul 4 loads per shift (8,700 gallons per load).

Need additional 260 acres for land disposal.

4 ponds in question as far as closure plan.

8 sludge ponds we can land apply.

BEST CASE (COST)

4 Years spraying.

Equipment cost - \$40,000

Labor - \$45,000

Operating cost - \$24,000.

Landscaping - \$70,000.

Not including (4) ponds in question.

Maintenance (3 years)
\$33,000

= \$212,000.

220

WORSE CASE (COST)

1 Year spraying and Hauling
Spray 4-1/4 million gallon;
Haul 13 million gallons.

Equipment cost - \$100,000..

2¢ per gallon (tank farm to field).
\$260,000.

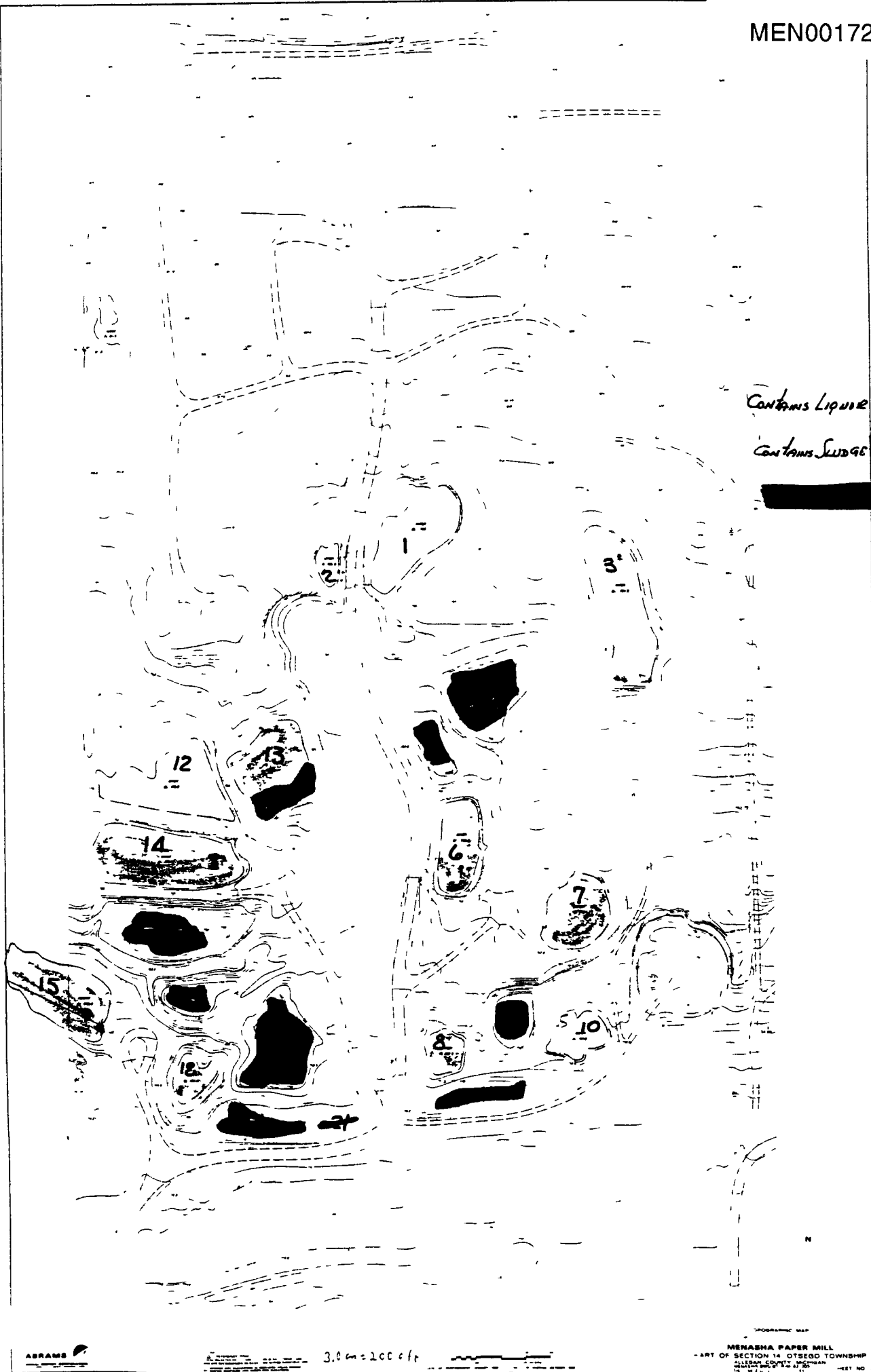
Labor, spraying and to tank farm -
\$20,000.

Equipment operating cost - \$15,000.

Landscaping - \$70,000.

Not including (4) ponds in question.

= \$465,000.





MENASHA CORPORATION

PAPERBOARD GROUP

September 2, 1986

Harry Steinberg
1391 Hill Road
Otsego, MI 49078

Dear Harry,

As discussed with you previously, Menasha Corporation would like to drain the storm water impoundment, located on the Northeast corner of Menasha's property, to the natural drainage pattern which goes across your property and then into the Gun River. After draining the storm water impoundment, Menasha would be removing a portion of the dike on the South East end of this impoundment next to your property line. Menasha would then install a tube under your road from the impoundment to the natural drainage area on the East side of your road. This in effect would restore this areas natural drainage pattern as it existed prior to 1973 when the dike was constructed. The only difference would be that the storm water run-off would cross your road through the tube rather than over the road as it did previously.

If you agree and consent to this proposal, please indicate this by signing both copies of this letter and returning one of them to us for our files.

Sincerely,

Otsego Paperboard Division

John R. Blauwkamp, P. E.
Corporate Environmental Manager

I Harry Steinberg agree to the content of this letter.

9-19-86
Date

Harry Steinberg
Harry Steinberg

kj



MENASHA CORPORATION

PAPERBOARD GROUP

August 20, 1986

John Vollmer
Surface Water Quality Division
MDNR
Plainwell, MI 49080

Dear John:

Following are the BOD test results completed on samples during the lowering of "Lake Menasha". Enclosed is a copy of the metal analysis completed by A & L Great Lakes Agricultural Laboratories, Inc.

BOD

7/16/86	before pumping	11 ppm
7/17/86	pumping	19 ppm
7/18/86	pumping	15 ppm
7/31/86	end of pumping	14 ppm

Approximate gallons pumped: 1.5 million.

Thank you for your cooperation in helping Menasha insure a safer environment.

Sincerely,

Otsego Paperboard Division

Sandra K. Jones
Corporate Environmental Engineer

cc: J. Blauwkamp
J. Bonham

kj

A & L GREAT LAKES AGRICULTURAL LABORATORIES, INC.

5011 Decatur Road • Fort Wayne, Indiana 46806-3085 • Phone: (219) 456-3545

**WATER ANALYSIS**REPORT NUMBER
F210-63ACUSTOMER #
59013SEND TO:
MENASHA CORP-SLUDGE PROJ
AL SWITZENBERG
P.O. BOX 155
OTSEGO MI 49078ATTENTION:

COPY TO:RE:
MENASHA CORP.

DATE: 08/01/86 PAGE: 1

SAMPLE ID: OVERFLOW POND
LABORATORY #: W07058

REQUESTED ANALYSIS	VALUE	UNIT
Copper (Cu)	**	ppm
Zinc (Zn)	***	ppm
Cadmium (Cd)	**	ppm
Chromium (Cr)	*	ppm
Lead (Pb)	****	ppm
Nickel (Ni)	****	ppm
Mercury	*****	ppb

COMMENT: * Below detectable limit of 1 ppm.
 ** Below detectable limit of 0.1 ppm.
 *** Below detectable limit of 0.02 ppm.
 **** Below detectable limit of 0.5 ppm.
 ***** Below detectable limit of 0.5 ppb.

memo /  MENASHA
COP
MEN00176

TO: T. E. Clemmons

DATE: August 25, 1986

SUBJECT: Sludge Pond Closure
Project Update

FROM: Ron Thaxton 
Project Engineer

The sludge pond closure project as originally defined has been completed with the exception of the following.

1. Closing roadway areas.
2. Placement of deflectors to reduce washouts in some drain areas (mainly straw bales or rocks).
3. Seeding open reworked areas.

On May 29, 1986 a meeting was held to discuss the sludge pond closure project and other areas of concern in the sludge pond vicinity. Those that attended were John Blauwkamp, John Bonham, Al Switzenberg, Sandra Jones and myself. John mentioned that there are other problem areas to be addressed as follows:

Lake Menasha - Samples were taken and sent in for analysis. It will be necessary to drain the water down and install a permanent overflow pipe to maintain a controlled level in the pond. This also requires installation of a ditch from the Lake Menasha pond east to the ditch along the hill road to allow overflow from the pond to be directed to Gun River.

Area along south side of Lake Menasha - Has what appears to be traces of liquor. Samples have been sent for analysis and if found to contain liquor, will have to be hauled to a designated landfill.

Pond located just east of old landfill area - Has also shown some traces of sludge which could have washed into the pond from previous spraying in the field north of the pond. The pond will require being pumped down and bottom being checked for sludge. It is believed it will not be a problem.

As soon as a direction is determined from samples taken and the County Road Commission's decision on the ditch along the hill road, we will be able to submit a proposal to continue with the project on Phase II.

m

c J. Blauwkamp
J. Bonham
S. Jones
A. Switzenberg

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

November 5, 1986

Menasha Corp.

Reference is made to the 80 acre parcel located in the S.E. corner of sec 14, Otsego Twp.

Al Switzenberg and I looked at a severe gully problem in the approximate center of this land, we discussed possible solutions and also discussed possible seed mixtures on the surrounding land.

I visited this parcel again on Nov 5 and have the following information to offer.

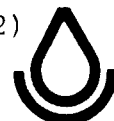
Soils in this area are mapped as "Marlette" soils. Soils of this type do not normally Yield high rates of run-off. The soil on this parcel, however has been reworked, has probably had fairly heavy applications of sludge and appears to be compacted. This results in higher than normal run-off rates. It is also probable that the series of ponds, that existed in the past, offered some temporary storage, thereby reducing run-off rate.

Run-off concentrates along the old sanitary land-fill access road causing a severe gully problem.

The upper half of the existing gully along the access road is on a very steep grade and will be difficult to stabilize using normal methods. Al and I discussed the possibility of a stone lined channel in this steep area. If properly constructed, it might work, but I believe the construction cost will be high.

Another possibility is to provide some temporary flood storage areas by means of diking and/or digging. Water from these temporary storage areas would be metered out *Thru* an underground conduit to a point where it could be safely discharged. (down-stream from the steep part of existing channel.)

(cont. page 2)



UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

(2)

Menasha Corp.

It may be difficult to get a significant amount of temporary storage behind a dike because of existing land slopes.

I believe a conventional waterway can be built on the lower portion of the existing channel (where a flatter grade exists). The waterway configuration should be trapazoidal (flat bottom), and sized to handle the expected run-off from a 10 year storm (min). This amounts to a 3.8" rain in a 24 hr. period.

A1 is in the process of establishing vegetation on the fields East and West of the lane. This vegetation, when properly established and maintained, will help to reduce run-off. The seeding also provides excellent habitat for wildlife.

A volunteer (?) stand of sweet clover exists in the west field. Existing Annual and *Perennial* weeds also help to provide cover.

I suggest re-inforcing the sweet clover where needed with 2#/ac of Timothy and 4#/ac of Smooth Brome grass. Do not Work up the field to seed the Timothy and Brome grass. Try brush-hogging part of field and then broadcasting seed in the Spring. This could be done on a trial basis. It's good to get some kind of grass in the sweet clover because of steep slopes.

Seeding on the open area (westerly part of west field) should be 2#/ac of Timothy, 4#/ac Smooth Brome grass and 2#/ac of sweet clover. As in all seedings, lime and fertilizer should be applied according to soil tests.

After seedings are established, any mowing should be delayed until after bird nesting season (July 15). It is desirable to mow not more than half the field in a given year.

(Cont. page 3



UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

(3)

Menasha Corp.

Because we have limited personnel and a heavy work load on cropland areas, we will be unable to do the engineering work that needs to be done. If time permits, we may be able to work on a consultative basis with the firm you hire.

I realize this is general information, but I hope it provides you with some ideas of how to correct the erosion problem.

Very truly yours,
Bernard G. Haveman
Bernard G. Haveman
Soil Conservation Technician

BH/nb

cc: *Switzenberg.*





MENASHA CORPORATION

PAPERBOARD GROUP

November 11, 1987

Orchard Hill Landfill
3378 Hennesey Road
Watervliet, Mi. 49098

Dear Sir:

Enclosed are the EP toxicity studies on three materials to be hauled to your landfill.

Sample #1, South side of digester, is an additional test run on the material previously approved on November 6, 1987. This is the soil which has been contaminated by sodium carbonate and is presently being hauled to your landfill.

Sample #2, Area of no growth at back liquor pond, is soil from a previous liquor solids clean up. This area was wet and could not be completed at that time. There is approximately 30 yards of this material.

Sample #3, Floor of weak liquor berm, is a mixture of sand and liquor solids similar to material previously hauled to your landfill. It is estimated that 300-500 yards will be removed to the landfill.

All materials to be hauled are of a nonhazardous nature.

If you have any questions please contact the writer or John Bonham.

Sincerely,

Otsego Paperboard Division

Keith B. Kling

Keith B. Kling
Waste Treatment Supervisor

Enclosure
/ac

cc: ~~John Bonham~~
Ron Thaxton



PREIN & NEWHOF, P.C.
ENGINEERS — SURVEYORS
ENVIRONMENTAL & SOILS LABORATORIES
3000 EAST BELT LINE N E, GRAND RAPIDS, MICHIGAN 49505
285 JAMES STREET, SUITE E, HOLLAND, MICHIGAN 49423

MEN00181

TELEPHONE (616) 364 8491
TELEPHONE (616) 394 9218

H. EDWARD PREIN PE, RLS
THOMAS NEWHOF PE
WILSON D. McQUEEN PE
LARRY D. WILSON PE
MICHAEL S. FULLER PE
PHILIP C. GLUPKER PE
JAMES A. COOK PE
ROBERT J. VANDER MALE PE
ROBERT J. REIMINK PE
RICHARD L. SERBOWICZ PE
ARTHUR W. BRINTNALL RLS
REX A. MILLIRON RLS

November 10, 1987
77129

Mr. John Bonham
Menasha Corporation
P O Box 155
Otsego, MI 49078

Re: Soil Samples received 10/30/87

LABORATORY RESULTS

<u>Parameters</u>	<div><div>①</div><div>②</div><div>③</div></div>		
	South Side of Digester 0-2'	Area of no growth @ back of Liq. Pond	Floor of weak liquor berm
Total Cyanide, mg/kg as received	<0.25	<0.25	<0.25
<u>EP Toxicity Leachate Concentrations:</u>			
Arsenic, mg/L	0.0024	0.0041	0.0052
Barium, mg/L	<0.01	<0.01	<0.01
Cadmium, mg/L	<0.006	<0.006	<0.006
Chromium, mg/L	<0.04	<0.04	<0.04
Copper, mg/L	0.13	0.13	0.31
Lead, mg/L	<0.08	<0.08	<0.08
Mercury, mg/L	<0.0004	0.0010	0.0008
Selenium, mg/L	<0.005	<0.005	<0.005
Silver, mg/L	0.02	0.07	0.04
Zinc, mg/L	1.62	0.656	0.600

PREIN & NEWHOF

Jane Hoch
Jane Hoch

Alternatives - Evaluations

Landfill and Liquor Pond Closure

Ground Water 48

ADDENDUM I
TO THE
EVALUATION OF POND CLOSURE ALTERNATIVES

- Ponds 1, 2, 10, 12 and 14 -

MENASHA CORPORATION
OTSEGO, MICHIGAN

June, 1984

Prepared by:
WILKINS & WHEATON TESTING LABORATORY, INC.
Kalamazoo, Michigan

2106

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APPENDICES

Appendix A: Analysis of Fly Ash

Introduction

This report has been prepared as an addendum to the report entitled "Evaluation of Pond Closure Alternatives", May, 1984, prepared by Wilkins & Wheaton Testing Laboratory, Inc. The report contained information regarding the physical and chemical characteristics of the sludge and supernatant from Menasha Ponds #1, #2, #10, #12 and #14 and the alternatives available for their closure. Based on this study, additional information was required to pursue recommended alternatives.

The contents of the following report include the results of the field work conducted on Ponds #1 and #14, an evaluation of the consistency and permeability of the sludge in the five ponds, preliminary calculations on the capacity of the landfill, and a proposed work plan for disposal of the sludge into the landfill.

Pond #1

As discussed in the full report, Pond #1 is located in the northwestern portion of the project site, across the Menasha access road from Pond #2. The somewhat oval-shaped pond measures approximately 250 feet across the north-south axis by 125 feet across the east-west axis.

The pond was probed every 15 feet along the north-south and east-west axes (Figure 1). Probe depths ranged between approximately 2 and 12 feet. Table 1 lists the results of the field data. The maximum sludge thickness encountered was 7.58 feet and the maximum depth of supernatant was 4.33 feet. The sludge in Pond #1 is characteristic of the sludge in the other ponds in that it is black in color, fibrous, and density increases with depth. The overlying supernatant is black in color with a strong odor. The chemical characteristics of the material are comparable to the concentrations analyzed for in the full report.

Two cross-sections were constructed from the field data (Figures 2 and 3). As these figures indicate, the sludge surface and bottom is irregular with a high volume of overlying supernatant. Based on these cross-sections and the associated probing data, the volume of sludge was calculated at approximately 84,528 cubic feet. The volume of supernatant was estimated at 76,300 cubic feet (570,724 gallons).

A sample from the pond was collected near the northeastern end. A soft sediment coring device was used for the sampling. A seven-foot core of the sludge was obtained and was used in part for the consistency and permeability evaluation for comparison with other ponds.

It should also be noted that there are numerous trees and branches protruding from the surface of the pond. Much of this material is submerged in the sludge. Additionally, a delta-like deposit of granular material is located on the northwestern shore of the pond. There is the potential that sludge underlies this deposit.

TABLE 1

PROBE DEPTHS OF POND #1

Menasha Corporation
Otsego, Michigan

(Surface Elevation of Pond: 782.1 feet)

East-West Traverse (beginning at west side, progressing at
15 foot intervals):

<u>Depth to Bottom</u>	<u>Supernatant Depth</u>	<u>Thickness of Sludge</u>	<u>Bottom Elevation</u>
6.75 feet	2.75 feet	4.00 feet	775.35 feet
7.50	3.83	3.67	774.60
8.17	3.83	4.34	773.93
8.42	4.33	4.09	773.68
8.92	3.83	5.09	773.18
10.58	4.25	6.33	771.52
11.67	4.08	7.59	770.43
10.67	4.33	6.34	771.43
8.83	4.00	4.83	773.27

North-South Traverse (beginning at south end, progressing at
15 foot intervals):

<u>Depth to Bottom</u>	<u>Supernatant Depth</u>	<u>Thickness of Sludge</u>	<u>Bottom Elevation</u>
8.08 feet	4.50 feet	3.58 feet	774.02 feet
10.17	4.33	5.84	771.93
9.75	4.58	5.17	772.35
10.08	4.33	5.75	772.02
9.92	4.00	5.92	772.18
9.33	4.17	5.16	772.77
8.92	3.92	5.00	773.18
9.17	4.00	5.17	772.93
7.33	3.17	4.16	774.77
6.58	2.67	3.91	775.52
5.25	2.25	3.00	776.85
3.83	1.50	2.33	778.27
3.67	2.00	1.67	778.43
3.50	1.92	1.58	778.60
2.00	1.50	0.50	780.10

Pond #14

Pond #14 is located adjacent to the southern side of Pond #12 in the western portion of the project site. An overflow pipe from Pond #12 extends into Pond #14, as discussed in the full report. The pond is somewhat oval to rectangular in shape with surface measurements of approximately 300 feet (east-west) by 125 feet (north-south).

The pond was probed every 20 feet along the north-south and east-west axes (Figure 4). Table 2 lists the results of the probing and associated information. Probe depths ranged between approximately 3 and 14.5 feet, with a maximum sludge thickness of 6.92 feet and a maximum depth of supernatant of 9.33 feet.

Cross-sectional evaluation indicates the depth of the sludge is greater on the southern and eastern ends of the pond (Figures 5 and 6). This was expected as the overflow pipe from Pond #12 is located at the northeastern corner of the pond. It is likely that this material washed into Pond #14. Based on the field data, the calculated volume of sludge in the pond is approximately 17,591 cubic feet. The volume of supernatant is estimated at approximately 178,530 cubic feet (1,335,403 gallons).

The sludge and supernatant in Pond #14 is noticeably different than that of the other ponds. The supernatant is lighter in color with a weaker odor. The sludge appears to have a much lower solids content, in that it is looser in consistency. Two cores were obtained through the use of a soft sediment coring device. The cores were very difficult to obtain because of the looser consistency of the material. The cores indicate a very fluid sludge near the surface, underlain by a dense layer of material which when broken was dry and flakey inside. When fluid was added to this material, it decomposed readily upon visual inspection. The core extended into the granular material underlying the pond. The sand did not appear to have sludge permeated into it. It is likely that the dense .5 to 1 foot layer of material at the pond bottom is serving as a barrier for seepage into the materials underlying the pond.

TABLE 2

PROBE DEPTHS OF POND #14

Menasha Corporation
Otsego, Michigan

(Surface Elevation of Pond: 766.1 feet)

East-West Traverse (beginning at east side, progressing at
20 foot intervals):

<u>Depth to Bottom</u>	<u>Supernatant Depth</u>	<u>Thickness of Sludge</u>	<u>Bottom Elevation</u>
8.42 feet	4.33 feet	4.09 feet	757.68 feet
9.00	5.00	4.00	757.10
9.42	5.25	4.17	756.68
9.83	5.25	4.58	756.27
8.92	6.67	2.25	757.18
9.50	6.00	3.50	756.60
13.75	6.50	7.25	752.35
14.50	7.58	6.92	751.60
11.67	8.50	3.17	754.43
7.42	5.42	2.00	758.68
7.67	6.42	1.25	758.43
7.83	7.00	0.83	758.27
5.83	5.00	0.83	760.27
4.75	3.50	1.25	761.35
3.00	2.00	1.00	763.10

North-South Traverse (beginning at north end, progressing at
20 foot intervals):

<u>Depth to Bottom</u>	<u>Supernatant Depth</u>	<u>Thickness of Sludge</u>	<u>Bottom Elevation</u>
4.75 feet	4.17 feet	0.58 feet	761.35 feet
7.67	6.00	1.67	758.43
10.50	7.00	3.50	755.60
12.67	9.33	3.34	753.43
9.00	5.17	3.83	757.10

Evaluation of Consistency and Permeability

As discussed in the main report, the recommended alternative for disposal is mixing the sludge with available fly ash and landfilling the material in the on-site landfill. To evaluate the potential affects of this material, two types of evaluation were undertaken; the consistency of the mixtures and the permeability of the sludge/ash mixtures.

On May 31, 1984, sludge samples from Pond #12 and freshly deposited ash at the landfill were obtained. The sludge sample area on Pond #12 was selected to represent a solar-dried sample which would be the result of removing the supernatant from the ponds and a brief drying period. The ash sample was characteristic of all ash materials observed at the landfill.

Since there is a lack of a standardized consistency test available, the evaluation of the sludge/ash mixture was completed through the observation of mixing in the laboratory and drying tests. The sludge and ash were mixed on a weight ratio basis. Five ratios of sludge to ash were selected: 5:1, 4:1, 3:1, 2:1, and 1:1

In the more equal ratios (2:1 and 1:1), the ash volume, due to its lower density, exceeded the sludge volume. It was at these ratios that the material was the most difficult to mix. In association to working in the field with equipment such as bull dozers, mixing would probably not be adequate and results inconsistent. Even though the sludge has a soft, semi-rigid sticky paste texture, it is smooth. As the ash content increases, it still maintains the same textural characteristics but has less voids and is easier to work with until the ash volume exceeds the sludge volume.

In the remaining ratios, the material was easiest to mix as the sludge volume increased. The material still maintained the thick paste appearance but was easier to mix. The confirmation of this was when a 1:1 ratio of the material was combined with a small amount of water. The added water created a combination that was easy to blend.

As shown in Table 3, the ease in mixing is proportional to the moisture content. Since there is not much free water available and the mixtures are relatively impermeable, as discussed later, a more stable mixture would be obtained by bringing the sludge to the landfill, mixing it with ash on-site and then allowing a sufficient drying period.

After samples of the different ratios were dried, two noticable characteristics were observed: 1) the higher the ash content of the sample was, the harder or denser the dried sample was, and 2) the higher the sludge content, the more dessication cracks were present. Both of these were partially a function of moisture content and/or fiber content. The hard, dried state of the mixture represents a surface that would be relatively impermeable.

Since the organic fiber content of the samples is similar to that found in natural lake sediments, some similar properties can be anticipated. As documented in literature, primarily through lake drawdown methods, dried lake sediments do not easily absorb water. Upon drying, the organic sediments form a unique bonding that is not easily dissolved by water contact. Samples of the dried sludge were rewetted and the same characteristics were noted.

In regard to permeability, the sludge/ash mixtures were evaluated through a falling head permeability test. Ratios of 2:1 to 4:1 were selected as they represent the most probable range of mixtures achieved in the field. The results, as listed in Table 3, demonstrate that the material does have some impermeable properties. By simply placing the pure sludge in a screened sieve, the water placed on top does not easily percolate through. Drying the material, though not tested, has the potential to increase the permeability.

Table 3
 PHYSICAL PROPERTIES OF SLUDGE/ASH MIXTURES
 Menasha Corporation
 Otsego, Michigan

<u>Sample Ratio</u> <u>Sludge: Ash</u> <u>(by weight)</u>	<u>Percentage of Sample</u> <u>% Sludge/% Ash</u> <u>(by weight)</u>	<u>Percent Moisture</u> <u>(by weight)</u>	<u>Mixability</u> <u>w/Sludge</u>	<u>Appearance After Drying</u>	<u>Permeability</u> <u>(cm/sec)</u>
5:1	83.4/16.6	65.28	Good	Volume reduction; pulls away from sides	1.659×10^{-6}
4:1	80/20	61.29	Good	Volume reduction; begins to crack	3.046×10^{-5}
3:1	75/25	59.95	Fair	Reduced volume; cracks; increased density and hardness	1.290×10^{-6}
2:1	66.7/33.3	54.25	Poor	Pulls away from sides; some cracking; dense	1.088×10^{-6}
1:1	50/50	48.54	Poor	Smoother surface, minimal cracking, very hard	*
1:1 (plus water)	46.5%/46.5% plus 7% water	56.87	Excellent	Reduced volume, heavily cracked, dense	*
Sludge	100% Sludge	72.07	N/A	Extremely reduced volume; heavily cracked	*

N/A - Not Applicable

* - Test Not Run on this Sample.

In summary, the sludge/ash mixtures are not easily mixed when the ash volume exceeds the sludge volume. Mixing is greatly facilitated by the amount of moisture present in the samples. The combination of the two materials creates a very homogeneous mixture that has the texture of wet mortar which is easily worked with. Upon drying, the mixture becomes hard and does not readily absorb moisture.

Summary of Sludge/Supernatant Volumes.

The following table lists the approximate volume of supernatant and sludge for Menasha Ponds #1, #2, #10, #12 and #14. Volumes are based on field measurements taken on March 20 and May 31, 1984, and are subject to change depending on weather conditions.

<u>Pond</u>	<u>Sludge Volume</u>			<u>Supernatant Volume</u>
	<u>Cubic Feet</u>	<u>Cubic Yards</u>	<u>Gallons</u>	<u>(Gallons)</u>
1	84,528	3130.7	632,269	570,724
2	14,792	547.9	110,940	24,929
10	33,543	1242.3	251,572	37,547
12	227,120	8411.9	1,703,400	30,381
14	<u>17,591</u>	<u>651.5</u>	<u>131,581</u>	<u>1,335,403</u>
TOTALS:	377,574	13,984.3	2,829,762	1,998,984

[6/6/84 - ~ 40,000 yds - if fly ash available at 10¢/yd
for mixing:]

Landfill Capacity - Preliminary Calculations

As discussed in the full report, a recommended alternative to pursue included removal and deposition of the sludge into the Menasha-owned, on-site landfill if approved by the MDNR. The material would be mixed with the fly ash currently in the Landfill, as previously discussed. It has been determined that there is in excess of 40,000 cubic yards of fly ash currently in the landfill. Appendix A includes analytical data on the fly ash produced at Menasha.

To further determine the feasibility of this alternative, existing data was reviewed to determine the approximate capacity of the landfill. To facilitate these calculations, several points on the landfill surface were surveyed to determine the existing elevations present.

Utilizing the current closure plan for the landfill, preliminary calculations indicate that there is room for approximately 17,000 cubic yards of material. As previously outlined in this report, there is approximately 14,000 cubic yards of sludge in the five ponds. Additionally, approximately 16,000 cubic yards of cover material will be needed to put a two-foot cap on the landfill.

Two options could be pursued to expand the capacity of the landfill to accommodate the additional material plus the cover. The existing plan could be used and all elevations could be raised by a minimum of two feet; or the final contours could be adjusted so the landfill surface was crowned with drainage ditches or grass waterways located around the perimeter. The latter of these two options would likely result in a higher capacity for the landfill and a more effective surface drainage system. Revision of the existing Closeout Plan could be achieved in a timely fashion for submittal to the MDNR for approval.

Proposed Work Plan

As outlined in the Recommendations section of the main report, the sludge material could be disposed of in the landfill if approved by the MDNR. The plan is basically the same, except for some modifications based on the additional work addressed in this addendum.

Since there is some difficulty in mixing the solar dried sludge with the ash, it is recommended that the sludge be taken from the ponds (after removal of the supernatant) and mixed with the ash prior to drying. The moisture content will not be that much greater than that of the solar dried material. The additional moisture will facilitate the mixing and permit more ash to be mixed in. This will create a more consistent mixture that will be less susceptible to cracking upon drying and will dry to a harder material.

As pointed out, there is more than an adequate amount of ash available for mixing. The ideal range for the sludge/ash ratio is from 2:1 to 4:1. Since the sludge does not easily exude water, there would be no problem in dumping the sludge directly onto the ash, then mixing the materials, and letting the mixture solar dry. Prior to final landfilling, any excess moisture would be readily filtered and absorbed by the ash.

Two diked areas could be created for this mixing. After the materials were combined, one diked area could be permitted to dry while the other one is utilized for the blending process. After a sufficient drying period, the material could be pushed into a landfill area and a new diked area created.

Ash currently being generated could be stockpiled outside of the landfill area to preserve landfill space and supply material for ease in mixing. The only constraints would be that dumping of the sludge into diked areas should not take place on days of heavy rainfall, which could permit excessive percolation or runoff of materials.

WILKINS & WHEATON TESTING LABORATORY, INC.

Even though there will have to be some modification to the final Close-out Plan of the landfill, the capacity does exist to accept all of the material. Since there is already a monitoring program in operation at the landfill site, any potential negative impacts can be detected. By placing the sludge in the on-site landfill and mixing it with ash, an effective and environmentally-sound method of disposal is achieved.

APPENDIX A

Analysis of Fly Ash



HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation

408 Auburn Avenue
Pontiac, MI 48058

313 334-1630
313 334-4747

9-6-83

MEN00199

Menasha Corporation
320 North Farmer Street
Otsego, MI 49078
Att: Mr. Roys

Sample received: 8-12-83

Hydro Number: 67451

Client I.D. ASTM D 3987 Leachate Procedure on Ash-8-83

Lead, Pb, mg/l	<0.05
Arsenic, As, mg/l	0.03
Cadmium, Cd, mg/l	<0.01
Selenium, Se, mg/l	<0.005
Iron, Fe, mg/l	<0.02
Zinc, Zn, mg/l	<0.02
Copper, Cu, mg/l	<0.02
Nitrogen Nitrate, N, mg/l	0.08
Sulfate, SO ₄ , mg/l	290
Chloride, Cl, mg/l	2
pH	7.7
Total Chromium, Cr, mg/l	<0.02
Total Dissolved Solids, mg/l	383

700 grams of solids were leached with 2800 mls of deionized water for 48 hours.

Linda Deans
Linda Deans
General Laboratory Manager

MEN00200

Parker, Rosemary and Dale Between: "Otsego paper mill phasing out old lagoons for new waste-storage plan," Kalamazoo Gazette, October 3, 1982.

Otsego paper mill phasing out old lagoons for new waste-storage plan

By ROSEMARY PARKER
Gazette Correspondent
and DALE BETWEE
Gazette Staff Writer

Regional

OTSEGO — The Menasha Corp. is spending \$1.5 million to construct new waste storage facilities that will make 26 open air sludge-drying lagoons at its Otsego paperboard operation a part of the mill's unlanded past.

Big concrete storage tanks and two asphalt lined lagoons to handle the firm's wastewater sludge and pulping chemicals are taking shape at the northeast corner of Menasha's complex along the Kalamazoo River here.

This project is a part of a major renovation of our entire facility to put it into state of the art condition, mill General Manager Bruce Buchanan told Otsego city commissioners recently.

Buchanan said other projects in the works include improvements to the physical plant and grounds and improved manufacturing equipment. Menasha has some 225 workers here who turn wood chips into the fluted portion of cardboard. About 300 tons of the fluting roll out of the mill each day.

The old lagoons have not been a source of odor complaints since 1977 when Menasha discontinued using sulphur compounds in its process, but they have done little

to beautify the north city landscape.

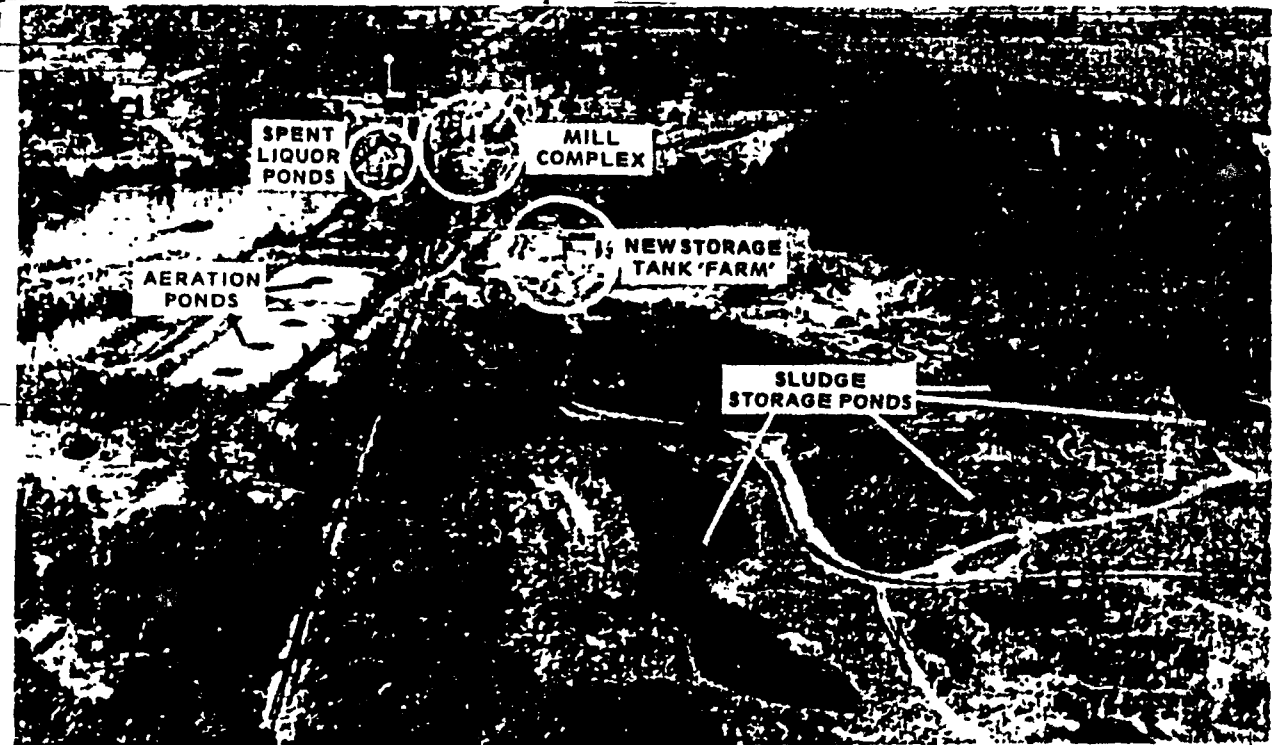
The mill manager said that while the new holding tanks will yield Menasha some operational flexibility, mostly the project accomplishes what he thinks is the company's social and aesthetic responsibility.

"The old, unlined lagoons are not acceptable from a ground water protection standpoint and are not aesthetically acceptable anymore either," Buchanan said.

The new "tank farm," will consist of three partially buried concrete storage tanks with a total capacity of 1,800,000 gallons and two lagoons each capable of holding 1 1/2 million gallons. The lagoons are being constructed with an asphalt bottom to prevent any liquids from seeping down into the soil and contaminating ground-water supplies.

Menasha is the only Kalamazoo-area papermaker that begins at the beginning — with wood pulp — and that gives it special wastewater handling problems.

The chemical solution used to break down the wood fibers called



pulping liquor, will continue to be stored after it is "spent," Buchanan said.

"We incinerate it and then are able to reclaim its basic ingredient, which is sodium carbonate, for reuse," Buchanan said.

The mill's other waste is the much more familiar sludge, or as Buchanan calls it, "the dead bug bodies" filtered from wastewater clarifiers.

That material must also be stored until it can be hauled in tank trucks to be applied to some of Allegan County's sandier farm fields.

"The sludge is a soil conditioner, improving both the organic content and water retention capability," Buchanan said.

When the new storage complex, now about 40 percent complete, is ready, wastes will be pumped into it directly from the mill through permanent plumbing. Also next year, the "decommissioning" of the old sludge lagoons will begin.

Spent liquor from lagoons next to the plant and sludge in old lagoons will be hauled up to the new facility until it can be disposed of permanently, Buchanan said.

The closing of the old lagoons is

expected to take about 18 months and cost the company another \$750,000. Fencing, fill and landscaping of the former lagoons will complete the project, he said. Menasha is also closing an old company landfill.

Marjorie Spruit, water quality specialist with the Department of Natural Resources' Grand Rapids office, said the Menasha project will yield long term protection of Kalamazoo River water. The DNR has encouraged the project, Spruit said. Menasha "has undertaken the project voluntarily, there is no order to do so."

Menasha's paperboard division in Otsego is phasing out its long standing sludge-lagoon system. A \$1.5 million project calls for the construction of a trio of huge concrete tanks as well as two new asphalt-lined lagoons. The above aerial photograph by the Gazette's Jerry Campbell shows some of the progress in construction.

DOORBUSTER

DOORBUSTER

DOORBUSTER



MEN00201

STORMWATER PERMIT APPLICATION

DOCUMENT #10

MENASHA CORPORATION
Otsego, Michigan

FORM 1, FORM 2F

Storm Water Permit

prepared by:

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

5440 North Cumberland Avenue
Suite 111
Chicago, Illinois 60656

Project N^o: 591-6218

September 30, 1992

I hereby certify that this report was prepared under
my direct supervision and that I am a duly
Registered Professional Engineer under the laws of
the State of Illinois.

Pauline M. LeBlanc

Pauline M. LeBlanc, P.E.
Illinois P.E. #062-041279





Environmental
Science &
Engineering, Inc.

MEN00204

September 30, 1992

Mr. Dave Drullinger
Department of Natural Resources
Surface Water Division
P. O. Box 30038
Lansing, MI 48909

RE: Storm Water Permit - Forms 1 and 2F
Menasha Corporation
Otsego, Michigan

Dear Mr. Drullinger

On behalf of Menasha Corporation, enclosed please find the forms required for the Otsego facility to obtain a Storm Water Permit.

Should you have any questions regarding the forms, please do not hesitate to contact our office.

Sincerely,

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.


Robert F. Mesec
Senior Staff Scientist

Pauline M. LeBlanc, P.E.
Manager, Environmental Department

RFM/PML/mah
92092815.LTR
591-6218.5100

Print or type in the unshaded areas only
-in areas are spaced for elite type, i.e., 12 characters/inch)

Form Approved OMB No 2040-0086. Approval expires 5-31-92.

U.S. ENVIRONMENTAL PROTECTION AGENCY GENERAL INFORMATION Consolidated Permits Program (Read the "General Instructions" before starting.)		I. EPA I.D. NUMBER	
		F M I D O O 6 0 1 2 4 0 5	
		1 2 3 4 5 6 7 8 9 10 11 12	
II. POLLUTANT CHARACTERISTICS I. EPA I.D. NUMBER II. FACILITY NAME III. FACILITY MAILING ADDRESS IV. FACILITY LOCATION PLEASE PLACE LABEL IN THIS SPACE		GENERAL INSTRUCTIONS If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete items I, III, V, and VI (except VI-B which must be completed regardless). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.	

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK "X"			SPECIFIC QUESTIONS	MARK "X"		
	YES	NO	FORM ATTACHED		YES	NO	FORM ATTACHED
Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2G) FORM 2F	X			D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)		X		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

SKIP MENASHA CORPORATION

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title) KLING KEITH ENV. SUPERVISOR

B. PHONE (area code & no.) 616 692 6141

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX 320 NORTH FARMER STREET

B. CITY OR TOWN OTSEGO

C. STATE MI

D. ZIP CODE 49078

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER 320 NORTH FARMER STREET

B. COUNTY NAME LLEGAN

C. CITY OR TOWN OTSEGO

D. STATE MI

E. ZIP CODE 49078

F. COUNTY CODE (if known)

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST				B. SECOND			
C	7	2	6 3 1	(specify)	C	7	(specify)
PULP AND PAPER							
C. THIRD				D. FOURTH			
C	7	(specify)		C	7	(specify)	

VIII. OPERATOR INFORMATION

A. NAME												B. Is the name listed in Item VIII-A also the owner?					
C	MENASHA CORPORATION												<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO				
C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box, if "Other", specify.)														D. PHONE (area code & no.)			
F = FEDERAL S = STATE P = PRIVATE				M = PUBLIC (other than federal or state) O = OTHER (specify)				P	(specify)	C	A	6 1 6	6 9 2	6 1 4 1			
E. STREET OR P.O. BOX																	
3 2 0 NORTH FARMER STREET																	
F. CITY OR TOWN										G. STATE		H. ZIP CODE		IX. INDIAN LAND			
B O T S E G O										M I		4 9 0 7 8		Is the facility located on Indian lands? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)										D. PSD (Air Emissions from Proposed Sources)									
C	T	I	M I 0 0 0 3 8 2 4							C	T	I							
9	N									9	P								
B. UIC (Underground Injection of Fluids)										E. OTHER (specify)									
C	T	I								C	T	I	(specify)						
9	U									9			M I 0 0 0 0 3 3 3						
C. RCRA (Hazardous Wastes)										E. OTHER (specify)									
C	T	I								C	T	I	(specify)						
R										9									

MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

MENASHA CORPORATION MANUFACTURES PULP AND PAPER. THE PULP IS MADE FROM POST CONSUMER WASTE AND WOOD CHIPS. THE PAPER IS MADE FROM VARIOUS GRADES OF CORRUGATED MEDIUM.

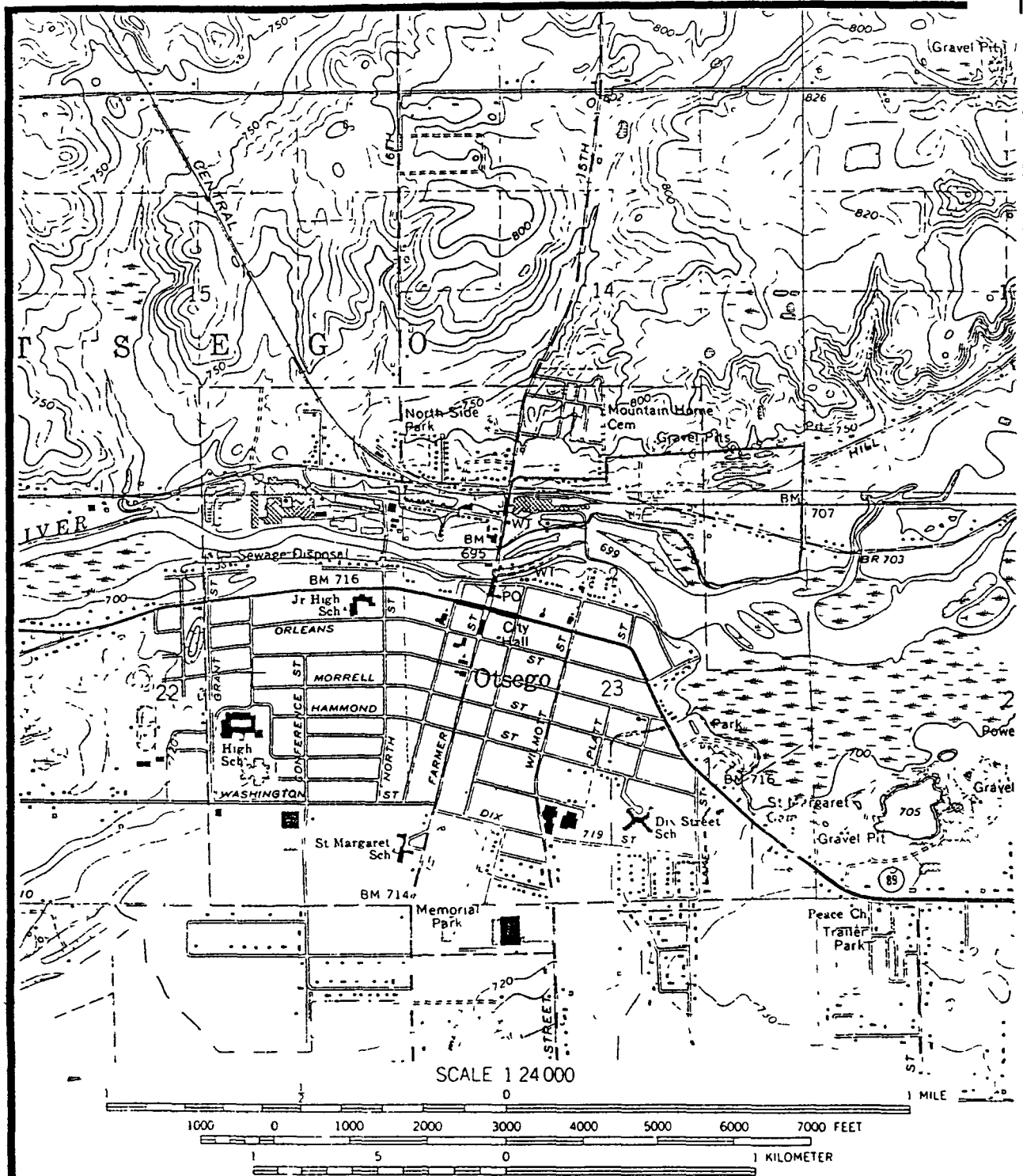
XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)		B. SIGNATURE		C. DATE SIGNED	
KEITH KLING ENV. SUPERVISOR		<i>Keith B. Kling</i>		9/28/92	

COMMENTS FOR OFFICIAL USE ONLY

--	--



Otsego Quadrangle, Michigan 7.5 minute Series

LAT 85° 41' 30"
LONG 42° 27' 52"

MENASHA CORPORATION

320 N. Farmer Street
Otsego, MI

Form 1- Storm Water Permit Application

Topographic Map



Environmental
Science &
Engineering, Inc.

Form

L2F
INDEXES



United States Environmental Protection Agency
Washington, DC 20460

Application for Permit To Discharge Stormwater Discharges Associated with Industrial Activity

MEN00208

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 28.6 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, or suggestions for improving this form, including suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M St. SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

1 Outfall Location

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A Outfall Number	B Latitude		C Longitude			D Receiving Water (name)
A (list)						
A	85	41' 33"	42	27'	42"	KALAMAZOO RIVER
B	85	41' 30"	42	27'	42"	KALAMAZOO RIVER
C	85	41' 27"	42	27'	42"	KALAMAZOO RIVER
001	85	41' 32"	42	27'	42"	KALAMAZOO RIVER
002	85	41' 32"	42	27'	42"	KALAMAZOO RIVER
003	85	41' 31"	42	27'	42"	KALAMAZOO RIVER

note: non-stormwater discharges are not included in this section

refer to NPDES Permit No. MI0003824

II. Improvements

A Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders and grant or loan conditions.

[illegible]

8 You may attach additional sheets describing any additional water pollution (or other environmental projects which may affect your discharges) you now have under way or which you plan. Indicate whether each program is now under way or planned, and indicate your actual or planned schedules for construction.

III. Site Drainage Map

Attach a site map showing topography (or indicating the outline of drainage areas served by the outfall(s) covered in the application). If a topographic map is unavailable) depicting the facility including, each of its intake and discharge structures, the drainage area of each storm water outfall, paved areas and buildings within the drainage area of each storm water outfall, each known past or present area used for outdoor storage or disposal of significant materials, each existing structural control measure to reduce pollutants in storm water, each materials loading and access areas, areas where pesticides herbicides soil conditioners and fertilizers are applied, each of its solid waste treatment storage or disposal units (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34), each well where fluids from the facility are injected underground, springs and other surface water bodies that receive storm water discharges from the facility.

Continued from the Front

IV. Narrative Description of Pollutant Sources

- A. For each outfall, provide an estimate of the area (include units) of impervious surfaces (including paved areas and building roofs) drained to the outfall, and an estimate of the total surface area drained by the outfall.

Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)	Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)
REFER TO ATTACHMENT A					

- B. Provide a narrative description of significant materials that are currently or in the past three years have been treated, stored or disposed in a manner to allow exposure to storm water; method of treatment, storage, or disposal; past and present materials management practices employed, in the last three years, to minimize contact by these materials with storm water runoff; materials loading and access areas; and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied.

REFER TO ATTACHMENT A

- C. For each outfall, provide the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of the treatment the storm water receives, including the schedule and type of maintenance for control and treatment measures and the ultimate disposal of any solid or fluid wastes other than by discharge.

Outfall Number	Treatment	List Codes from Table 2F-1
REFER TO ATTACHMENT A		

V. Nonstormwater Discharges

- A. I certify under penalty of law that the outfall(s) covered by this application have been tested or evaluated for the presence of nonstormwater discharges, and that all nonstormwater discharges from these outfall(s) are identified in either an accompanying Form 2C or Form 2E application for the outfall.

Name and Official Title (type or print)	Signature	Date Signed
KETH KLING ENV. SUPERVISOR	<i>Keith B. Kling</i>	9/28/92

- B. Provide a description of the method used, the date of any testing, and the onsite drainage points that were directly observed during a test.

NON STORMWATER DISCHARGES ARE INCLUDED IN NPDES PERMIT NO. MI0003824

VI. Significant Leaks or Spills

- Provide existing information regarding the history of significant leaks or spills of toxic or hazardous pollutants at the facility in the last three years, including the approximate date and location of the spill or leak, and the type and amount of material released.

NO SIGNIFICANT LEAKS OR SPILLS OF TOXIC OR HAZARDOUS POLLUTANTS HAVE OCCURRED AT THE FACILITY IN THE LAST THREE YEARS

A TOTAL LOSS OF APPROXIMATELY 5,000 GALLONS OF WHITEWATER FROM THE PROCESS TANKS WAS REPORTED TO MR. GENE MOGG OF THE MICHIGAN DEPT. OF NATURAL RESOURCES IN SEPTEMBER OF 1991. REFER TO A PROGRESS REPORT SUBMITTED TO THE MICHIGAN DEPT. OF NATURAL RESOURCES.

Continued from Page 2

MEN00210

VII. Discharge Information

A, B, C, & D: See instructions before proceeding. Complete one set of tables for each outfall. Annotate the outfall number in the space provided.

Tables VII-A, VII-B, and VII-C are included on separate sheets numbered VII-1 and VII-2.

Potential discharges not covered by analysis - Is any pollutant listed in Table 2F-2 a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ Yes (list all such pollutants below)☒ No (go to Section IX)

VIII. Biological Toxicity Testing Data

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ Yes (list all such pollutants below)☒ No (go to Section IX)

A QUARTERLY TOXICITY TEST IS CURRENTLY BEING CONDUCTED ON THE FACILITIES WASTEWATER. ACUTE, DEFINITIVE TESTS ARE CONDUCTED USING FATHEAD MINNOWS AND DAPHNIA MAGNA. THE TESTS ARE 96-HOUR IN DURATION FOR THE FATHEAD MINNOWS AND 48-HOUR IN DURATION FOR D. MAGNA.

NONE OF THE TESTS RESULTED IN SIGNIFICANT MORTALITY TO THE ORGANISMS.

NO TOXICITY TESTING HAS BEEN PERFORMED ON STORMWATER DISCHARGES.

IX. Contract Analysis Information

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

☒ Yes (list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)☐ No (go to Section X)

A. Name	B. Address	C. Area Code & Phone No.	D. Pollutants Analyzed
ENVIRONMENTAL SCIENCE & ENGINEERING, INC.	8901 INDUSTRIAL ROAD PEORIA, IL 61615	(309) 692-4422	OIL & GREASE PH, BOD, COD, TSS, TKN, NITRATE, NITRITE, TPHOSPHOROUS, SOLUBLE ORTHO- PHOSPHOROUS, TOTAL ZINC, COPPER

X. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name & Official Title (type or print)

KEITH KLING ENVIRONMENTAL SUPERVISOR

B. Area Code and Phone No.

(616) 692-6141

C. Signature

Keith B. Kling

D. Date Signed

9/28/92

MEN00211

WTFALL A

Discharge Information (Continued from page 3 of Form 2F)

Part A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (if available)	Maximum Values (include units)		Average Values (include units)		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Oil and Grease	14 ^{mg} /L	-			1	
Biological Oxygen Demand (BOD5)	32 ^{mg} /L	26 ^{mg} /L			1	
Chemical Oxygen Demand (COD)	178 ^{mg} /L	170 ^{mg} /L			1	
Total Suspended Solids (TSS)	128 ^{mg} /L	63 ^{mg} /L			1	
Total Kjeldahl Nitrogen	2.08 ^{mg} /L	2.23 ^{mg} /L			1	
Nitrate plus Nitrite Nitrogen	1.07 ^{mg} /L	0.86 ^{mg} /L			1	
Total Phosphorus	0.51 ^{mg} /L	0.49 ^{mg} /L			1	

pH	Minimum 6.66	Maximum	Minimum	Maximum
----	--------------	---------	---------	---------

Part 8 - List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

[illegible]

MEN00212

ITFALL B

Discharge Information (Continued from page 3 of Form 2F)

Part A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant and AS Number (if available)	Maximum Values (include units)		Average Values (include units)		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Oil and Grease	1mg/L	—			1	
Biological Oxygen Demand (BOD5)	1mg/L	8mg/L			1	
Chemical Oxygen Demand (COD)	11mg/L	136mg/L			1	
Total Suspended Solids (TSS)	18mg/L	54mg/L			1	
Total Kjeldahl Nitrogen	0.49mg/L	0.55mg/L			1	
Nitrate plus Nitrite Nitrogen	0.08mg/L	0.26mg/L			1	
Total Phosphorus	0.18mg/L	0.74mg/L			1	
	Minimum 7.69	Maximum	Minimum	Maximum		

Part 8 - List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

[illegible]

- You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Minimum	Maximum	Minimum	Maximum
6.80			

Part B - List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPOES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

EPA Form 3510-2F (11-90)

MEN00214

[illegible]

Part D. Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

1. Date of Storm Event	2. Duration of Storm (in minutes)	3. Total rainfall during storm event (in inches)	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Maximum flow rate during rain event (gallons/minute or specify units)	6. Total flow from rain event (gallons or specify units)	7. Season sample was taken	8. Form of Precipitation (rainfall, snowmelt)
Sept. 02 1992	110 min.	0.10 in.	approximately 288 hours	254.38 cubic ft. per sec.	516.80 cubic ft.	summer	rainfall
"	"	"	approximately 288 hours	168.0 cubic ft. per sec.	1139.06 cubic ft.	summer	rainfall
"	"	"	approximately 288 hours	265.21 cubic ft. per sec.	141.94 cubic ft.	summer	rainfall

9. Provide a description of the method of flow measurement or estimate.

OUTFALL A & C - Flow rate was estimated by measuring velocity & flow depth approximately every 20 minutes & converting flow depth to cross-sectional area of flow based on the dimensions of the conveyance

OUTFALL B - Flow rate was estimated using the Santa Barbara Runoff Hydrograph Method which calculates the runoff depth throughout the storm event based on cumulative rainfall and surface characteristics of the drainage basin and then converts depth to runoff rates

ATTACHMENT A
Menasha Corporation
Otsego, Michigan
Stormwater Permit Application
Form 2F

SECTION IVA

<u>Outfall Number</u>	<u>Area of Impervious Surface</u>	<u>Total Area Drained</u>
A	68,906 sq.ft.	68,906 sq.ft.
B	151,875 sq.ft.	151,875 sq.ft.
C	18,675,000 sq.ft.	19,125,000 sq.ft.
001	12,276 sq. ft.	12,276 sq.ft.
002	8,649 sq.ft.	8,649 sq.ft.
003	-----	25,200 sq. ft.
municipal system	134,550	134,550

SECTION IVB

Description of Significant Materials

The following are significant materials stored outside at this facility.

Raw Materials

Various solvents are stored in drums located in a covered non-flammable chemical storage structure located north of the plant in the chip yard area. The storage building has a sloped floor with its own drainage system. This area does not discharge into any surface water body. All drainage is drummed and disposed of properly. Solvents consist mostly of:

Isopar-m
Naphtha-360

Outdoor storage of wood chips and wastepaper (stored in area drained by Outfall C)

Outdoor storage of coal (stored in area drained by Outfall B)

Waste Materials

Spent cooking liquor tank farm located at north east portion of PROPERTY (stored in area drained by Outfall C). The tank farm is located in a cement vault, that prevents contact with stormwater runoff.

Attachment A

Page 2

Organic sludge is located adjacent to spent cooking liquor tank farm at northeast portion of PROPERTY (stored in area drained by Outfall C). The sludge lagoons have sloped walls that prevent stormwater runoff.

Other

Above ground storage tank containing fuel oil is located in the chip yard area (stored in area drained by Outfall C).

Soda ash and SLI product tanks are located on the north side of the plant (stored in area that drains to the treatment plant).

Soda ash loading/hauling area located on south side of plant (stored in area that drains to the treatment plant).

Landfill area consists of approximately 78 acres located at the northeast area. This area has its own drainage catch basin which does not discharge into any surface water body.

Pesticides, herbicides, fertilizers and soil conditioners are not used at this facility.

NPDES permit # MI0003824 discharges directly to the Kalamazoo River. The non-stormwater discharge does not use any of the outfalls listed in Section 1. The permit consists of: Non-contact cooling water, treated vacuum pump seal water, heat exchanger shower water, condensate, treated process wastewater, lime slurry, misc. seal and cooling water, recovery evaporates condensate, boiler blow down, zeolite recharging wastewater, roof, floor drain, turbine condenses water. (not represented in stormwater sampling)

SECTION IV C

Structural controls used at the facility include reduction of outdoor storage areas, reduction of outside maintenance areas, and inside storage of solvents.

Non-structural controls include employee training, spill reporting and clean-up and good housekeeping techniques.

Outfall A is located at the Southwest corner of the property along the Kalamazoo River. This drainage point covers areas such as the warehouse truck dock, employee parking lot, and roof drainage. The stormwater runs off the PROPERTY through four (4) catch basins which tie together and drain directly to the Kalamazoo River.

Attachment A

Page 3

Outfall B is located at the South portion of the PROPERTY along the Kalamazoo River. This drainage point covers areas such as the coal storage area, power house activity, soda ash loading/hauling and roof drainage. The stormwater runs off the property through one (1) catch basin which discharges directly to the Kalamazoo River near the dam.

Outfall C is located at the Southeast portion of the PROPERTY along the Kalamazoo River. This drainage point covers area such as raw materials storage and handling, waste material storage, and handling, fuel oil tank, railroad tracks, and coal storage area. The stormwater runs off the PROPERTY through a series of catch basins, located north of River Road stormwater flows through a ditch at the waste material storage area and tie in with the catch basin, and discharges directly to the Kalamazoo River.

The remaining drainage points, on the PROPERTY, consists of the north side of the plant which mostly drains the rail car loading area. This area connects with the municipal storm sewer on Farmer Street. This area does not have an excessible sampling point.

Outfall 001 and 002 are located on the Southwest portion of the PROPERTY and discharges directly to the Kalamazoo River. Both outfalls drain the employee parking lot. This area was not sampled but can be represented by the sampling of Outfall A.

Outfall 003 is located on the South portion of the PROPERTY, along the Kalamazoo River. This outfall has poor drainage, on an all dirt surface area. This area consists of sheet flow with small roof drainage. This area was not sampled but can be represented by the sampling of Outfall B.

PAPERBOARD DIVISION

KNAUF PAPERBOARD CORPORATION

August 17, 1994

Lisa Harry
MDNR Surface Water Quality Division
Plainwell District Office
621 North Tenth Street
PO Box 355
Plainwell, MI 49080

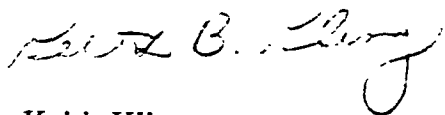
Dear Ms. Harry:

Please find enclosed a completed NOTICE OF INTENT form for coverage of storm water discharges associated with our facility. Page 2 of this form indicates that an individual stormwater application was previously submitted. This was done in February, 1990. A copy of the MDNR acknowledgement letter is attached.

Please notify me when training courses are being offered by MDNR so we can begin preparation of our Storm Water Pollution Prevention Plan.

If you have any questions concerning this application, please contact me at 616/692-6141.

Sincerely,



Keith Kling
Environmental Supervisor

KK:nam
Enclosures (2)

cc: John Bonham
David Merkel
Al Switzenberg
Len Myers
Pete DeRossi

Otsego Mill
320 N Farmer St
PO Box 155
Otsego MI 49078-0155
1-616-692-6141
1-616-692-2060 (Fax)

NOTICE OF INTENT for coverage under
National Pollutant Discharge Elimination System (NPDES)
GENERAL PERMIT
Storm Water Discharges Associated with Industrial Activity
 By Authority of Act 245, P.A. 1929 as amended

Submission of this Notice of Intent (NOI) constitutes notice that the party identified in Section I.A. of this form requests authorization to discharge under NPDES General Permit No. MIO000000 issued for storm water discharges associated with industrial activity in Michigan. The Michigan Department of Natural Resources may deny coverage under this general permit and require submittal of USEPA application forms 1 and 2F for an individual permit or an application to be covered under an alternative general permit. Becoming a permittee obligates a discharger to comply with the terms and conditions of the general permit. Failure to comply with these provisions may result in fines of up to \$25,000 per day and the possibility of imprisonment, in accordance with Act 245.

ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.

Print or type in the spaces provided. Attach extra sheets of paper, if needed, clearly indicating which section you are addressing.

I. PERMITTEE/SITE INFORMATION	
<p>A. Parent Company, Division & Owner: Give the name of the parent company/division/owner. If this is the same as the facility name, leave this space blank.</p> <p>B. Primary Standard Industrial Classification (SIC) Code: To determine the activity in which a facility is primarily engaged, the SIC Manual recommends using a value of receipts or revenues approach. For example, if a facility manufactures both metal and plastic products, the facility would total receipts for each operation. The operation that generates the highest revenue for the facility indicates the operation in which the facility is primarily engaged.</p> <p>C. Facility Name & Address: Give the name and address of the facility where storm water discharge associated with industrial activity occurs.</p> <p>D. Contact Person, Mailing Address & Telephone #: Give the name, mailing address, and telephone number of the person to contact in case questions and/or problems arise from this form or the general permit.</p> <p>E. Facility Location: Identify the proper location of the center of the facility in terms of quarter-quarter section, quarter section, township, range, and county.</p> <p>F. Receiving Waters: Name the water(s) that directly receive storm water runoff from the site. If the discharge flows through a municipal separate storm sewer, name the owner/operator of the municipal separate storm sewer system and the surface water into which the storm sewer discharges.</p>	
<p>A. PARENT COMPANY, DIVISION & OWNER: <u>Menasha Corp. - Paperboard Div.</u> <u>1645 Burgstrom Rd. Neenah Wi.</u></p>	<p>B. PRIMARY STANDARD INDUSTRIAL CLASSIFICATION(SIC) CODE: Use 4 digits: <u>2631</u></p>
<p>C. FACILITY NAME & ADDRESS: <u>Menasha Corporation</u> <u>Paperboard Division</u> <u>320 N. Farmer St.</u> <u>Otsego, MI. 49073</u></p>	<p>D. CONTACT PERSON, MAILING ADDRESS & TELEPHONE #: <u>Keith E. Kling - Env Supervisor</u> <u>320 N. Farmer St.</u> <u>Otsego, MI. 49073</u> <u>616/572-6141 Ex 406</u></p>
<p>E. FACILITY LOCATION: <u>NE 1/4 NW 1/4 Section 23, Town 01N.</u> Range, <u>12W</u> County: <u>Allegan</u></p>	<p>F. RECEIVING WATERS: <u>Kalamazoo River</u> OWNER/OPERATOR OF MUNICIPAL SEPARATE STORM SEWER SYSTEM: <u>NA.</u></p>

DNR USE ONLY - DO NOT WRITE IN SHADED AREA

NPDES PERMIT NUMBER:

DESIGNATED NAME: _____

MI _____

BASIN CODE: _____

BASIN YEAR: _____

CONTINUED ON REVERSE SIDE

disposal:
facilities:

NATURAL RESOURCES COMMISSION
THOMAS J. ANDERSON
MARLENE J. FLUHARTY
GORDON E. OLIVER
KERRY KAMMER
ELLWOOD A. MATTSOHN
O. STEWART MYERS
RAYMOND ROUPPE

MEN00220

DEPARTMENT OF NATURAL RESOURCES

DAVID F. HALEY, Director
P.O. BOX 30028
LANSING, MI 48909

May 25, 1990

Mr. James B. Porter
Menasha Corp, Paperboard Group
320 N. Farmer St.
Otsego, MI 49078-0155

Dear Mr. Porter:

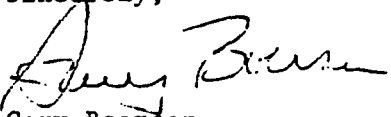
SUBJECT: Stormwater Permit Submittal

We have received your submittal dated February 6, 1990, pursuant to Section 402(p) of the Federal Clean Water Act, which required the filing of stormwater applications by February 4, 1990. The U.S. Environmental Protection Agency (EPA) has not yet finalized the stormwater permitting regulations required under the Clean Water Act.

If it is determined that a permit is needed to establish necessary controls, we will process your application. Otherwise, your submittal will be maintained on file until the federal regulations have been finalized and application forms are available. The information in your file will be reviewed to determine if you will need to fill out a new form, or update your previous submittal. We will advise you of any additional requirements at that time.

If you have any questions, please contact me.

Sincerely,



Gary Boersen
Permits Section
Surface Water Quality Division
517-373-1982

cc: SWQD District Office

PERMIT NO. MI0000000

DNR 

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq; the "Act"), and Michigan Act 245, Public Acts of 1929, as amended, (the "Michigan Act"), storm water associated with industrial activity, as defined under 40 CFR 122.26(b)(14)(i-ix) and (xi), or as deemed necessary under Section 402(p)(2)(E) of the Act, is authorized to be discharged from facilities in accordance with conditions set forth in this general permit.

The applicability of this general permit shall be limited to point source discharges of storm water (and non-storm water identified in Section I.C.3.b. of this general permit) which discharge either directly or via a storm sewer system to surface waters of the State, and which have not been determined by the Michigan Department of Natural Resources to need individual permits.

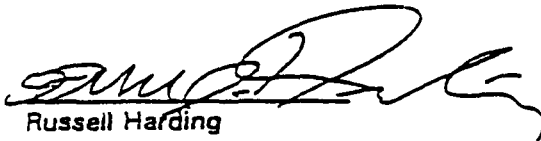
This permit is valid authorization to discharge only if accompanied by a Certificate of Coverage issued for an individual facility by the Michigan Department of Natural Resources.

This permit may authorize storm water discharges associated with industrial activity that are mixed with storm water discharges associated with construction activities provided that the storm water discharge from the construction activity is in compliance with Rule 2190 of the Part 21 Rules of the Michigan Act.

The terms and conditions of this general permit shall apply to an individual facility and shall take effect on the date of issuance of a Certificate of Coverage for the facility. The Michigan Commission of Natural Resources may grant a contested case hearing on this general permit in accordance with Section 8(3) of the Michigan Act. Also, the Michigan Commission of Natural Resources may grant a contested case hearing on the Certificate of Coverage issued to an individual facility under this general permit in accordance with R 323.2192(c) of the General Rules of the Michigan Act.

This general permit shall expire at midnight January 31, 1999.

Issued February 15, 1994


Russell Harding
Deputy Director for Environmental Protection

WEIR CONSOLIDATION PROJECT

DOCUMENT #11

		May 31, 1990 - July 31, 1991	August 1, 1991 - End of Permit
BOD 5	1 Day Maximum	7,833 #/day	10,008 #/day
	Monthly Average	3,889 #/day	4,962 #/day
TSS	1 Day Maximum	11,000 #/day	14,328 #/day
	Monthly Average	5,500 #/day	7,164 #/day

III. Modifications To Waste Treatment System

Pilot plant studies are in progress to understand the impact which the mill expansion will have on the waste treatment system's ability to meet all permitted effluent discharge limitations. Until the pilot plant studies are complete and all data analyzed, and the final permit limitations have been issued, it is not possible to determine with certainty what system changes if any, will be necessary. If it is determined that system changes are required, Menasha Corporation will submit construction permits for approval as required prior to commencing work.

IV. Weir Consolidation

The mill currently discharges to the Kalamazoo River through five permitted outfalls, as follows:

Outfall	Description	Maximum Flow
001	Noncontact cooling water	600,000 gpd
002	Vacuum pump seal water, heat exchanger cooling water and other noncontact cooling water	800,000 gpd
003	Treated process wastewater from outfall 000	920,000 gpd
003 & 005	Turbine condensor water	6,955,000 gpd
004	Noncontact cooling water, boiler blowdown, zeolite recharging wastewater, roof drains	234,000 gpd

Page 5

Menasha proposes no changes to outfall 001. To simplify monitoring and reporting, however, it is proposed that all of the remaining outfalls be combined prior to discharge into one outfall. A diagram of this proposal is attached and labeled Figure 1. A single monitoring and sampling station will be built to sample the effluent after flows from 000, 002, and 004 are combined, but before the turbine condensor water is added.

Under the current permit, although outfalls 000 and 002 are monitored individually, the resultant BOD 5 and TSS results are summed for purposes of the permit's effluent limitations. By combining these two flows into one outfall, the same result is achieved with less measuring and reporting necessary. Outfall 004 is virtually free of BOD 5 and TSS, and monitored by means of a weekly grab sample. In this combined scenario, any contribution it does make to BOD 5 and TSS is accounted for.

The turbine condensor water will be diverted into the common outfall downstream of the monitoring station. This will reduce the number of permitted outfalls to two; 001 and 003.

Due to the time involved in engineering design, funding approval, and construction, it is difficult to establish an exact date when this weir consolidation can occur. Therefore, Menasha Corporation proposes the following schedule for purposes of this permit renewal. The weir consolidation will be completed sometime after the new NPDES permit is issued on May 31, 1990, but no later than July 31, 1991 when the capital expansion will be completed. Until such time as the weir consolidation is complete, the new permit limits on BOD 5 and TSS will be applied to the sum of the measured results on outfalls 000 and 002. This is the same method used in the current permit. Outfall 004 will continue to be limited and monitored as per the provisions of the current permit.

Menasha Corporation will notify the MDNR in writing at least two months prior to the date that the weir consolidation is executed. Once the weir consolidation is complete, the applicable BOD 5 and TSS limits will remain the same, but will be applied against one measurement from the combined outfall.

V. Total Flows

As outlined above, the total allowable combined flow from outfalls 000, 002, and 004 under the existing permit is 1,954,000 gallons per day. Due to continued production increases and the planned 1991 expansion, this is no longer adequate to meet the mill's needs. Menasha Corporation is requesting that this flow limit be increased to 3,000,000 gallons per day. This new flow limit would go into effect concurrently with the weir consolidation, which would be no later than July 31, 1991. Until

KBK

MEN00226

PAPERBOARD DIVISION

▲▲▲ MENASHA CORPORATION

May 3, 1991

Mr. Gene Mogg
Michigan Dept. of Natural Resources
621 10th Street
Plainwell, MI 49080

Dear Gene,

In accordance with the requirements of Permit #MI0003824, Part I. C. 3. a. I am submitting basic design parameters and plans for upgrading our waste treatment facility for your review.

Under current operating conditions our system receives a BOD loading of approximately 24,000 Lb/day with a daily water flow of 0.7 million gpd. TSS to the system averages 5000 Lb/day. After completion of our mill upgrade, BOD will increase to 28,000 Lb/day, flow will increase to 1.4 million gpd and TSS should remain about 5000 Lb/day.

Pilot Plant studies indicate that a 60 ft. clarifier will be required to provide adequate solids removal under the anticipated loading and operating conditions. The study also indicated that addition of four aerators will provide adequate oxygen for all but the most severe short term loadings. Our experience has shown that these short term drops in O_2 do not create significant problems for our operation.

The basic plans were described in writing when we submitted our Surface Water Application in September 1990. Further information was submitted on February 26, 1991 and March 19, 1991 as engineering data was developed. With the information presently available I feel I can give a clear layout for the proposed system modifications.

There will be two elements to our waste treatment modification. They will be constructed concurrently with both parts scheduled to be functional by August 30, 1991.

The major modification is expansion of the wastewater treatment capacity. This will include four main components.

- Installation of a second wastewater line from the mill to the aerated lagoon. The new line will run parallel to the existing wastewater line. The route is shown on drawing DM-83-471. The pipe will be 8" ductile iron with a concrete liner. This is the same material from which the existing line is constructed.

Otsego Mill
320 N Farmer St
PO Box 155
Otsego MI 49078-0155
1-616-692-6141
1-616-692-2060 (Fax)

Page 2
KBK - Mogg

- Four additional aerators will be added to the aerated lagoon. These aerators will be installed to work in conjunction with the existing five aerators. Although the specific supplier has not been selected at this time, the aerators to be purchased will be high speed, 75hp units. The oxygen exchange from the aerators will be capable of transferring at least 2.9 pounds of oxygen per horse power per hour.
- A 60 foot Eimco clarifier will be installed to handle the increased hydraulic flow to the system. The clarifier will be installed directly north of the existing clarifier within the present confines of our East Settling Pond. We have decided on a complete closure of this pond. All organic materials will be removed down to clean soil. Sludge removed from this pond will be applied to our approved sites in accordance with our permit. A copy of the preliminary clarifier plans have been included for your review.
- A new discharge line from 000 Weir to 00B Weir will be installed to handle the increased water flow. The routing of this line is shown on drawing #DM-83-471.

The second part of the waste treatment modification is consolidation of our existing weirs. The specific elements of the weir consolidation will be:

- Installation of tanks, pumps, and piping within the mill to redirect 002 wastewater to the East end of the mill.
- Installation of a magnetic flow meter and flow totalizer in the 002 discharge line.
- Construction of a new weir building (00B) which will consolidate and monitor the flows from 000, 002, and 004 outfalls. The new weir building is presently being designed.
- Cutover of piping from 000 and 004 discharges to 00B.
- Demolition of 002 aeration pond and building.

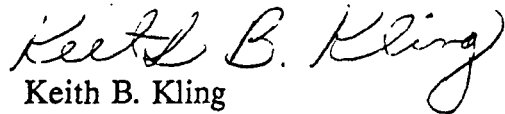
Preliminary groundwork on this project will begin on May 6 with expected project completion by August 30, 1991.

If you have any questions or concerns, please call the writer or John Bonham at 692-6141.

Page 3
KBK - Mogg

Sincerely,

Otsego Paperboard Division


Keith B. Kling
Environmental Supervisor

Enclosure

cc: John Bonham
Pete DeRossi
John Blauwkamp

KBK:amc

NATURAL RESOURCES COMMISSION

MARLENE J. FLUHARTY
ORDON E. GUYER
STEWART MYERS
RAYMOND POUPORE



JOHN ENGLER Governor

DEPARTMENT OF NATURAL RESOURCES

DELBERT RECTOR, Director
~~XXXXXXXXXXXXXXXXXXXX~~

District 12 Headquarters
P.O. Box 355, Plainwell, Michigan 49080

June 4, 1991

Mr. Keith B. Kling
Menasha Corporation
Paperboard Division
320 N. Farmer
Otsego, Michigan 49078-0155

Dear Mr. Kling:

SUBJECT: Proposed Wastewater Treatment Facility Modifications

We have completed our review of the plans and basis of design information provided with your May 3, 1991 letter to Mr. Gene Mogg. The information provided in this submittal, in conjunction with the performance of the existing treatment facility, indicates that the proposed facilities should be capable of meeting the limitations listed in Menasha's NPDES permit. The proposed modifications are therefore approved.

Please contact this office if you have any questions regarding this letter.

Sincerely,

Gregory A. Danneffel, P.E.
Surface Water Quality Division
616-685-9886

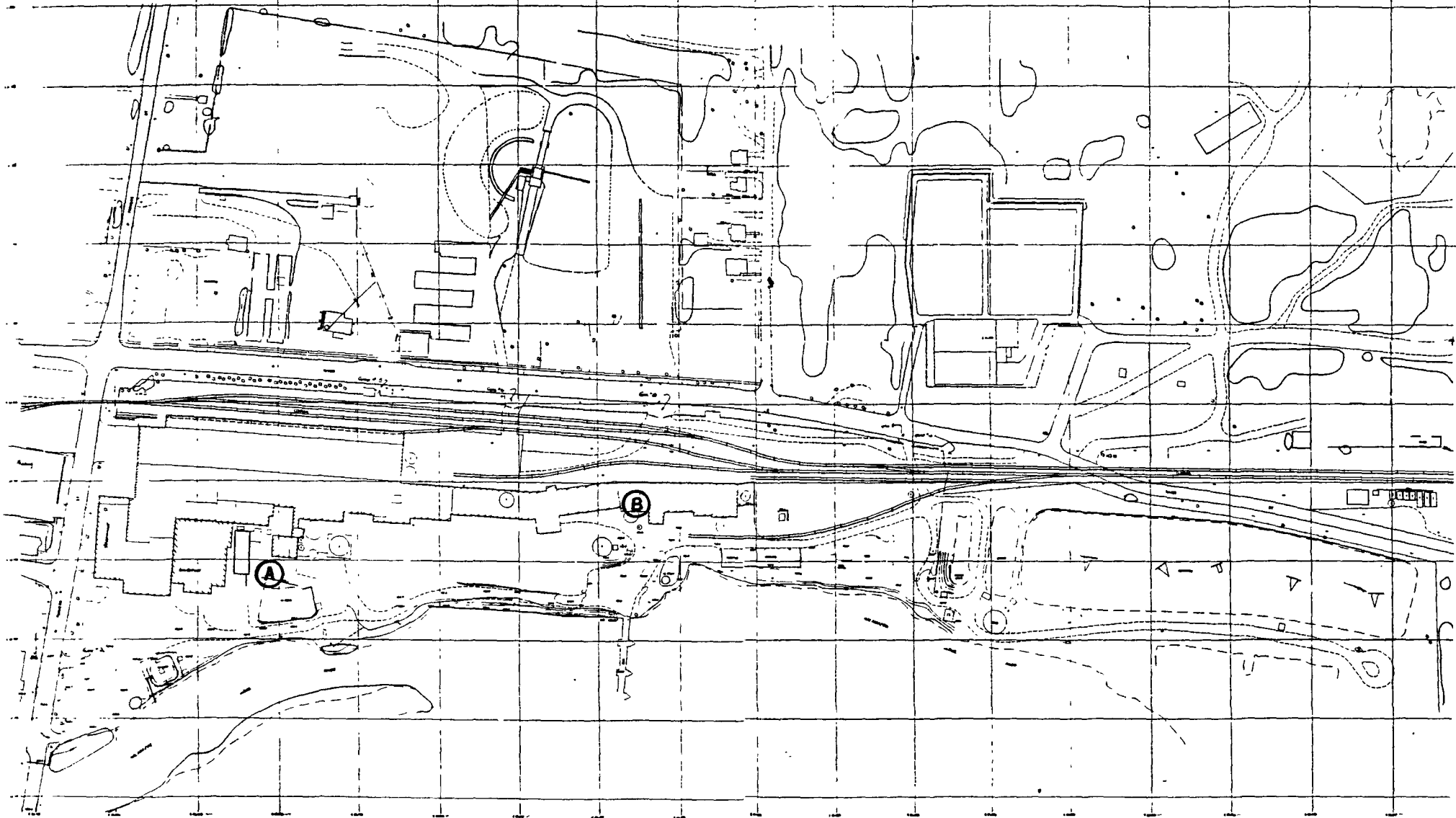
GD:clm

ELECTRICAL EQUIPMENT-- PHYSICAL LOCATIONS

DOCUMENT #12

MAP OF ELECTRICAL GENERATING EQUIPMENT

DOCUMENT #13



**LOCATION MAP OF
FRESH WATER
WELLS (PAST AND
PRESENT),
INCLUDING WELL
LOGS**

DOCUMENT #14

Fresh Water Wells

MEN00235




PEERLESS-MIDWEST, INC. Water Supply Contractors

5135 BITTERSWEET ROAD / GRANGER, INDIANA 46520 (317) 271-1100

WELL & PUMP INSPECTION REPORT

OWNER Mansfield Corporation
 CITY Steele STATE Ind.
 WELL NO 2 LOCATION Boiler Room Well
 DIA 16" DEPTH 60' TYPE WELL Gravel
 SCREEN ID 12" SCREEN LENGTH 24' DEPTH TO TOP OF SCREEN 44' TYPE SCREEN 5/8" 12" slot
 DATE DRILLED 1950 DATES OF CLEANING Record screen interval
 DATE INSPECTED 3-2-77 PERSON TO CONTACT Don Thaxton
 CONTACT LOCATION Plant

	DATE	STATIC	GPM	PUMPING LEVEL	PRESSURE	SPECIFIC CAPACITY
ORIGINAL	1950	8'	550	42'		13.2
AFTER LAST CLEANING	1975	12'	268	32'		13.4
AFTER LAST TEST	1974	15'	115	42'	25#	4.2
PRESENT AT LINE PRESSURE	1977	17'	285	38'	75#	13.5

TEST WILL BE COMPLETE THROUGH. TOP OF CHECK _____ METER _____ FLANGE OR THREAD SIZE _____

TOTAL PUMP SETTING 45' MOTOR HP 50 VOLTS _____ RPM 1

PUMP MFG Peerless SERIAL NUMBER 90124 AIRLINE LENGTH 11' 11" 1/2

RATED CAPACITY 100 GPM, 190 TDH; OPERATING PRESSURE _____

DATE INSTALLED 1950 DATES OF OVERHAUL 1970

IS CHECK VALVE LEAKING? YES _____ NO X DOES STUFFING BOX HAVE SPRINGS? No SIZE OF PACKING 2"

THE FOLLOWING IS TO BE PERFORMED DURING EACH INSPECTION.

CHANGE MOTOR OIL & GREASE X REPACK PUMP X GREASE PUMP X

(place check mark when completed)

PUMP IS PRESENTLY DEVELOPING 600 GPM 188 TDH, SHUT OFF HEAD _____ FT

ELECTRICAL DATA WITH PUMP IN OPERATION _____ AMPS, _____ VOLTS, _____ PHASE

MATERIALS NEEDED TO CLEAN WELL: Come off 3" flange one hose to tank & 40' to waste

NEED A SMEAL TO RAISE PUMP? No REMARKS Pump would have to be pulled with tripod

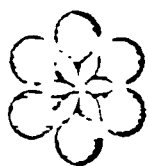
Well pumping quite alot of sand

INSPECTED BY Gary Holt

M-15310

Date February 14, 1963, 19 Field No. FW#1
Record by JB Cust. #13
Office No.
Source of data Driller's record

1. Location: State Michigan County Allegan-Otsego
Map Approx. 122' S. of River St. & 150' E. of power
plant near site of ... NE 1/4 sec. 23 T. 1N S. R. 12W E
2. Owner: Menasha Corp-Paperboard Div. Otsego
formerly Otsego Pulp & Paper Mills
Tenant _____ Address _____
Driller Layne-Northern Address by Paul Watt
3. Topography _____
4. Elevation Noted ft. above _____
5. Type: Dug, drilled, driven, bored, jetted 10-19-62
6. Depth: Rept. 93 ft. Meas. _____ ft.
7. Casing: Diam. 30 in. to 1 1/2 in. Type _____
Depth 31 ft. Finish _____
8. Chief Aquifer _____ From _____ ft. to _____ ft.
Others _____
9. Water level 13 ft. rept. 10-19-62 19 _____ XBOOK surface
max below _____ which is _____ ft. above
below surface
10. Pump: Type _____ Capacity _____ G. M.
Power: Kind _____ Horsepower _____
11. Yield: Flow _____ G. M., Pump _____ G. M., Meas. Rept. Est. _____
Drawdown 50 ft. after _____ hours pumping 1001 G. M.
12. Use: Dom., Stock, PS, RR, Ind., Irr., Oba.
Adequacy, permanence _____
13. Quality _____ Temp. _____ °F.
Taste, odor, color _____ Sample Yes _____
No _____
Unfit for _____
14. Remarks: (Log, Analyses, etc.) 20' of Everdur Bronze MH Cook
Screen, 12" Dia. I.D. Opening .030 - 26" Casing
cemented in 30" open hole drilled by reverse cir-
culation method
Gravel pack 47' to 83': 6 yds of #1220 silica gravel



PEERLESS-MIDWEST, INC. Water Supply Contractors
51255 BITTERSWEET ROAD/CRANER, INDIANA 46530/219 272-9050

WELL & PUMP SERVICE INSPECTION REPORT

OWNER Menasha Corporation
CITY Otsego STATE Michigan
WELL NO. 4 LOCATION 12' N. of Corner of Building & 100' S. of River Street
DIA 34" x 16" DEPTH 87' TYPE WELL Gravel Wall
SCREEN ID 12" SCREEN LENGTH 25' DEPTH TO TOP OF SCREEN 62' TYPE SCREEN Red Brass
DATE DRILLED 1967 DATES OF CLEANING 1969, 71, 72, 73, 74, 76, 78, 80, 82
DATE INSPECTED 2-3-84 PERSON TO CONTACT Ron Traxton
CONTACT LOCATION At Plant PHONE 616-692-6141

	DATE	STATIC	GPM	PUMPING LEVEL	PRESSURE	SPECIFIC CAPACITY
ORIGINAL	1967	21'	1001	67'	110#	21.7
AFTER LAST CLEANING	1982	20'	361	50'	105#	12.0
AFTER LAST TEST	1983	17'	402	56'	100#	10.3
PRESENT AT LINE PRESSURE	1984	20'	372	57'	103#	10.0

ST WILL BE COMPLETE THROUGH: TOP OF CHECK _____ METER _____ FLANGE OR THREAD SIZE 8"
TOTAL PUMP SETTING 81' MOTOR HP 75 GEAR DRIVE _____ VOLTS 220/440 RPM 1800
PUMP MFG Layne/Floway SERIAL NUMBER 58516 (78-10000) AIRLINE LENGTH 72'
RATED CAPACITY: 600 GPM; 247' TDH; OPERATING PRESSURE _____
DATE INSTALLED 1968 DATES OF OVERHAUL 1974, 78

IS CHECK VALVE LEAKING? YES _____ NO X DOES STUFFING BOX HAVE SPRINGS? No SIZE OF PACKING 3/8"

THE FOLLOWING IS TO BE PERFORMED DURING EACH INSPECTION

CHANGE MOTOR OIL & GREASE X REPACK PUMP X GREASE PUMP X

RPM METER REQUIRED No

PUMP IS PRESENTLY DEVELOPING 372 GPM 294' TDH, PROJECTED CURVE CAPACITY 600 GPM 258' TDH

ELECTRICAL DATA WITH PUMP IN OPERATION 53-54-54 AMPS; 360 VOLTS, 3 PHASE

MATERIALS NEEDED TO CLEAN WELL: Come off 8" head with elbow, one hose to tank and 40' to waste.

NEED A SMEAL TO RAISE PUMP? No REMARKS: Motor is screened. One 8" gasket.

R. Sell E. Buck

ಇದರಲ್ಲಿಯೂ:

INDIANAPOLIS • MEMPHIS • LANSING

1. 1. 1.

1. *Staphylococcus aureus* (ATCC 12228) was grown in tryptic soy broth (TSB) (Difco) supplemented with 0.5% yeast extract (Difco) and 0.5% glucose (Difco) at 37°C. Cells were harvested at mid-log phase (OD₆₀₀ = 0.5) and washed with phosphate buffered saline (PBS) (pH 7.4) containing 0.1% bovine serum albumin (BSA) (Pierce and Warriner, Inc.). Cells were then resuspended in PBS containing 0.1% BSA and 0.1% penicillin (100 U/ml) (Pierce and Warriner, Inc.).

Job No. 16312

Value Rs. 5000/- Case No. 5

Allegan

Cinema Menasha Corp.

Township Otsego

Section 23 TIN RIVER

Michigan

... ..

True Land Description: 12' E. of North leading dock 10' S. of RR Approx

From Street to Road 100' S. of River Street

Erwin H. A. Stahl, Jr.

Note 20 "Oil Drilled by: { Cable Tool _____ Rotary _____ Jetting _____
Reverse Circ. X Bucket _____ Auger _____

History of Use of Cement _____ Drilling Mud _____ Other _____

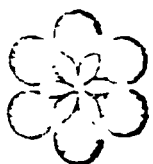
Coring 26 "CD From 12 "Above ground to 60 feet below ground. Weight _____ Pounds per foot

Screen 17 "S... .." 65 to 75 feet. Hole JOHNSON type SS size 25

Pumping rate 5 GPM drawdown to 69 feet after 3 hours pumping

5-22-73

— ५५ —



PEERLESS-MIDWEST, INC. Water Supply Contractors
51255 BITTERSWEET ROAD/GRANGER, INDIANA 46530/219 272-9050

WELL & PUMP SERVICE INSPECTION REPORT

OWNER Merasha Corporation
CITY Ottawa STATE Michigan
WELL NO 5 LOCATION 12' E. of Loading Dock & 10' S. of RR
DIA 30" x 12" DEPTH 76' TYPE WELL Gravel Wall
SCREEN ID 12" SCREEN LENGTH 15' DEPTH TO TOP OF SCREEN 61' TYPE SCREEN SSWW
DATE DRILLED 1970 DATES OF CLEANING 1971, 73, 74, 76, 78, 80, 82, 83
DATE INSPECTED 2-3-84 PERSON TO CONTACT Ron Maxton
CONTACT LOCATION At plant PHONE 616-692-6141

	DATE	STATIC	GPM.	PUMPING LEVEL	PRESSURE	SPECIFIC CAPACITY
ORIGINAL	1970	26'	500	69'		11.6
AFTER LAST CLEANING	1983	23'	257	55'		8.0
AFTER LAST TEST	1983	23'	271	68'	100#	6.0
PRESENT AT LINE PRESSURE	1984	23'	257	62'	104#	6.5

ST WILL BE COMPLETE THROUGH TOP OF CHECK _____ METER _____ FLANGE OR _____ SIZE 6"
TOTAL PUMP SETTING 74' MOTOR HP 40 GEAR DRIVE _____ VOLTS 440 RPM 1760
PUMP MFG. Lavna/Floway SERIAL NUMBER 63962 AIRLINE LENGTH 73'
RATED CAPACITY: 500 GPM; 247' TDH; OPERATING PRESSURE _____
DATE INSTALLED 1970 DATES OF OVERHAUL 1976, 81
IS CHECK VALVE LEAKING? YES _____ NO X DOES STUFFING BOX HAVE SPRINGS? No SIZE OF PACKING 3/8"

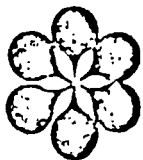
THE FOLLOWING IS TO BE PERFORMED DURING EACH INSPECTION:

CHANGE MOTOR OIL & GREASE X REPACK PUMP X GREASE PUMP X
RPM METER REQUIRED No

PUMP IS PRESENTLY DEVELOPING 257 GPM 302' TDH; PROJECTED CURVE CAPACITY 500 GPM 240' TDH
ELECTRICAL DATA WITH PUMP IN OPERATION 33-33-34 AMPS, 460 VOLTS, 3 PHASE
MATERIALS NEEDED TO CLEAN WELL: Drop out 6" tee, two 6" elbows, three hoses to tank and 10' to waste.

NEED A SMEAL TO RAISE PUMP? No REMARKS: Motor is screened. Used one 160# pressure gauge and one 1/4" petcock.

INSPECTED BY Russell E. Buck



PEERLESS-MIDWEST, INC. Water Supply Contractors
51255 BITTERSWEET ROAD/GRANGER, INDIANA 46530/219 272-9050

WELL & PUMP SERVICE INSPECTION REPORT

OWNER Menasha Corporation
CITY Otsego STATE Michigan
WELL NO. 6 LOCATION 150' N. of RR & 1000' NE of Menasha (West Well)
DIA. 12" DEPTH 99' TYPE WELL Tubular
SCREEN ID. 12" SCREEN LENGTH 14'9" DEPTH TO TOP OF SCREEN 84' TYPE SCREEN Type H Everdur
DATE DRILLED 1948 DATES OF CLEANING 1961, 75, 80, 81, 82, 83, 85
DATE INSPECTED 3/14/86 PERSON TO CONTACT Ron Thaxton
CONTACT LOCATION At Plant PHONE 616-692-6141

	DATE	STATIC	G.P.M.	PUMPING LEVEL	PRESSURE	SPECIFIC CAPACITY
ORIGINAL	1948	18'	960	46'		34.2
AFTER LAST CLEANING	1985	29'	489	53'	105#	20.3
AFTER LAST TEST	1985	26'	320	47'	110#	15.2
PRESENT AT LINE PRESSURE	1986	26'	420	58'	103#	13.1

TEST WILL BE COMPLETE THROUGH: TOP OF CHECK METER X FLANGE OR THREAD SIZE

TOTAL PUMP SETTING 75 1/2' MOTOR HP 60 GEAR DRIVE VOLTS 440 RPM 1800

PUMP MFG. Peerless SERIAL NUMBER 76045 AIRLINE LENGTH 60'

RATED CAPACITY: 750 G.P.M.; 250' T.D.H.; OPERATING PRESSURE

DATE INSTALLED 1949 DATES OF OVERHAUL 1961, 67, 71, converted 73, 79, 85

IS CHECK VALVE LEAKING? YES NO X DOES STUFFING BOX HAVE SPRINGS? No SIZE OF PACKING 1/2"

THE FOLLOWING IS TO BE PERFORMED DURING EACH INSPECTION:

CHANGE MOTOR OIL & GREASE X REPACK PUMP X GREASE PUMP X

RPM METER REQUIRED No

PUMP IS PRESENTLY DEVELOPING 420 G.P.M. 295' T.D.H.; PROJECTED CURVE CAPACITY 750 G.P.M. 235' T.D.H.

ELECTRICAL DATA WITH PUMP IN OPERATION 60, 60, 61 AMPS; 460 VOLTS; 3 PHASE

MATERIALS NEEDED TO CLEAN WELL: Drop out spool, two elbows off 8" head, two hoses to tank and two hoses to waste.

NEED A SMEAL TO RAISE PUMP? No REMARKS: Motor is screened.

INSPECTED BY Tony J. Ross



PEERLESS-MIDWEST, INC. Water Supply Contractors
51255 BITTERSWEET ROAD/GRANGER, INDIANA 46530/219 272-9050

WELL & PUMP SERVICE INSPECTION REPORT

OWNER Menasha Corporation
CITY Otsego STATE Michigan
WELL NO. 7 LOCATION 100' E. of Well #6
DIA. 12" DEPTH 100' TYPE WELL Tubular
SCREEN ID. 12" SCREEN LENGTH 15' DEPTH TO TOP OF SCREEN 85' TYPE SCREEN Type H
DATE DRILLED 1948 DATES OF CLEANING 1975, 76, 84
DATE INSPECTED 3/14/86 PERSON TO CONTACT Ron Thaxton
CONTACT LOCATION At Plant PHONE 616-692-6141

	DATE	STATIC	G.P.M.	PUMPING LEVEL	PRESSURE	SPECIFIC CAPACITY
ORIGINAL	1965	25'	596	42'		35.0
AFTER LAST CLEANING	1984	27'	467	34½'		62.2
AFTER LAST TEST	1985	26'	355	30'	110#	88.7
PRESENT AT LINE PRESSURE	1986	28'	430	38'	100#	43.0

TEST WILL BE COMPLETE THROUGH: TOP OF CHECK _____ METER X FLANGE OR _____
TOTAL PUMP SETTING 74'9" MOTOR HP 50 GEAR DRIVE _____ VOLTS 440 RPM 1800
PUMP MFG. Peerless/Floway SERIAL NUMBER 94182 AIRLINE LENGTH 75'
RATED CAPACITY: 500 G.P.M.; 255' T.D.H.; OPERATING PRESSURE _____
DATE INSTALLED 1977 DATES OF OVERHAUL 1983

IS CHECK VALVE LEAKING? YES _____ NO X DOES STUFFING BOX HAVE SPRINGS? No SIZE OF PACKING 3/8"

THE FOLLOWING IS TO BE PERFORMED DURING EACH INSPECTION:

CHANGE MOTOR OIL & GREASE X REPACK PUMP X GREASE PUMP X

RPM METER REQUIRED No

PUMP IS PRESENTLY DEVELOPING 430 G.P.M. 269' T.D.H.; PROJECTED CURVE CAPACITY 500 G.P.M. 238' T.D.H.

ELECTRICAL DATA WITH PUMP IN OPERATION 58-58-59 AMPS; 460 VOLTS; 3 PHASE

MATERIALS NEEDED TO CLEAN WELL: Turn pump off head, two hoses to tank and two hoses to waste.

NEED A SMEAL TO RAISE PUMP? Yes REMARKS: Motor is screened.

INSPECTED BY Tony J. Ross

WATER WELL RECORD

MICHIGAN DEPARTMENT OF
PUBLIC HEALTH

418

1 LOCATION OF WELL

County Alcona Township Name OTISCO Fraction 1/4 Section Number 23 Town Number N.S. Range Number E/W

Distance and Direction from Road Intersections
40° E. OF MAIN ROAD 80' N. OF RIVER.

Street address & City of Well Location
Locate with "1" in section below Sketch Map.

2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
<u>DIRTY SAND, GRAVEL</u>	<u>11</u>	<u>11</u>
<u>CLAY</u>	<u>15</u>	<u>26</u>
<u>FINE SAND</u>	<u>14</u>	<u>40</u>
<u>COURSE SAND</u>	<u>36</u>	<u>76</u>
<u>COURSE GRAVEL, BOULDERS</u>	<u>4</u>	<u>80</u>
<u>CLAY, BOULDERS</u>	<u>-</u>	<u>-</u>

3 OWNER OF WELL
MCNISH CORPORATION
Address
CITSEGO, MICHIGAN

4 WELL DEPTH (Completed) Date of Completion
80 ft. 1-29-79

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug
☐ Hollow rod ☐ Jetted ☐ Bored ☒ EC

6 USE: ☐ Domestic ☐ Public Supply ☒ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☐

7 CASING: Threaded ☐ Welded ☒ Height: Above Below
Diam. 12 in. to 62 ft. Depth 57 lbs./ft.
Weight 57 lbs./ft. Drive Shoe? yes ☐ No ☒

8 SCREEN:
Type JOHNSON W/W Dia. 12"
Slot/Gauze 030 Length 20'
Set between 6' ft. and 50' ft.
Fittings:

9 STATIC WATER LEVEL
11 ft. below land surface

10 PUMPING LEVEL below land surface
41 ft. after 8 hrs. pumping 800 g.p.m.
_____ ft. after _____ hrs. pumping _____ g.p.m.

11 WATER QUALITY in Parts Per Million:
Iron (Fe) _____ Chlorides (Cl) _____
Hardness _____ Other _____

12 WELL HEAD COMPLETION: ☐ In Approved Pit
☐ Pitless Adapter ☒ 12" Above Grade

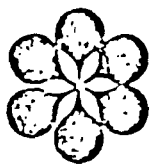
13 Well Grouted? ☒ Yes ☐ No
☐ Neat Cement ☒ Bentonite ☐
Depth: From 14 ft. to 57 ft.

14 Nearest Source of possible contamination
_____ feet _____ Direction _____ Type _____
Well disinfected upon completion ☐ Yes ☐ No

15 PUMP: ☒ Not installed
Manufacturer's Name _____
Model Number _____ HP _____ Volts _____
Length of Drop Pipe _____ ft. capacity _____ G.P.M.
Type: ☐ Submersible ☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Dr. R. J. ...
REGISTERED BUSINESS NAME _____ REGISTRATION NO. _____
Address _____
Signed FR 1 ... Date 3-1-79
AUTHORITY REPRESENTATIVE



PEERLESS-MIDWEST, INC. Water Supply Contractors
51255 BITTERSWEET ROAD/GRANGER, INDIANA 46530/219 272-9050

WELL & PUMP SERVICE INSPECTION REPORT

OWNER Menasha Corporation
CITY Otsego STATE Michigan
WELL NO. 8 LOCATION 40' E. of Plant & 80' N. of River
DIA. 30" x 12" DEPTH 80' TYPE WELL Gravel Wall
SCREEN ID. 12" SCREEN LENGTH 20' DEPTH TO TOP OF SCREEN 60' TYPE SCREEN SSWW
DATE DRILLED 1979 DATES OF CLEANING 1981, 82, 85
DATE INSPECTED 3/14/86 PERSON TO CONTACT Ron Thaxton
CONTACT LOCATION At Plant PHONE 616-692-6141

	DATE	STATIC	G.P.M.	PUMPING LEVEL	PRESSURE	SPECIFIC CAPACITY
ORIGINAL	1979	11'	800	52'		19.5
AFTER LAST CLEANING	1985	13'	323	53'		8.0
AFTER LAST TEST	1985	12'	214	53'	119#	5.2
PRESENT AT PRESSURE	1986	11'	267	54'	115#	6.2

EST WILL BE COMPLETE THROUGH: TOP OF CHECK _____ METER _____ ~~FLANGE OR~~ THREAD SIZE 4"
TOTAL PUMP SETTING 69' 4" MOTOR HP 75 GEAR DRIVE _____ VOLT 220/440 RPM 1760
PUMP MFG. Layne/Peerless SERIAL NUMBER 46096 AIRLINE LENGTH 55'
RATED CAPACITY: 1000 G.P.M.; 247' T.D.H.; OPERATING PRESSURE _____
DATE INSTALLED 1979 DATES OF OVERHAUL 1982, 85 pump only
CHECK VALVE LEAKING? YES _____ NO X DOES STUFFING BOX HAVE SPRINGS? No ^{SIZE OF} PACKING 3/8"
THE FOLLOWING IS TO BE PERFORMED DURING EACH INSPECTION:
CHANGE MOTOR OIL & GREASE X REPACK PUMP X GREASE PUMP X
PUMP METER REQUIRED No
PUMP IS PRESENTLY DEVELOPING 267 G.P.M. 319' T.D.H.; ^{PROJECTED} CURVE CAPACITY 1000 G.P.M. 252' T.D.H.
ELECTRICAL DATA WITH PUMP IN OPERATION 63-63-64 AMPS; 460 VOLTS; 3 PHASE
MATERIALS NEEDED TO CLEAN WELL: _____

NEEDED A SMEAL TO RAISE PUMP? Yes REMARKS: Motor is screened. Used
160# pressure gauge.

INSPECTED BY Tony J. Ross



MEN00245

TEST DRILLING REPORT

Well No. TW 90A City Otsego County Allegan
Owner Menasha Corporation Township Otsego; T1N, R12W
Section NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ of 23
Location _____ State Michigan

Approximately 100' SW of Well #6 & 100' North of RR Crossing on East River Street;
1800' East of Farmer Street

GRADE ELEVATION ABOVE MEAN SEA LEVEL — 715' + 3'

FORMATION	Top of Formation	Bottom of Formation	Thickness	Static Water Level	50% SIZE From: Sieve Analysis
Brown to Black Silty Fine Sand with Fine to Coarse Gravel	0'	4'	4'	-	-
Brown Fine Sand with Fine to Coarse Gravel	4'	6'	2'	-	-
Reddish-Brown Fine Sand	6'	12.5'	6.5'	-	-
Brown Fine Sand w/Fine to Coarse Gravel	12.5'	15'	2.5'	-	-
Brown Fine to Medium Sand, Little Coarse Sand & Fine Gravel	15'	27'	12'	24'	-
Brown Fine to Medium Sand	27'	32'	5'	24'	-
Heaving Brown Med. to Fine Sand, Little Coarse Sand & Fine Gravel	32'	41'	9'	24'	-
Heaving Brown Med. to Coarse Sand & Fine to Medium Gravel	41'	48'	7'	24'	-
Heaving Brown Med. to Fine Sand with Coarse Sand, Some Stones	48'	62'	14'	24'	.015
Heaving Brown Coarse to Fine Sand with Fine to Medium Gravel	62'	68'	6'	24'	.028
Heaving Brown Coarse to Fine Sand, Some Fine to Medium Gravel	68'	74.5'	6.5'	24'	.022
Heaving Brown Medium to Fine Sand, Some Very Fine Sand, Little Coarse Sand	74.5'	77'	2.5'	24'	.011
Tight Brown Medium to Fine Sand, Little Very Fine Sand & Coarse Sand, Silt Traces	77'	88'	11'	24'	.013

6-5/8" Dia. hole drilled by hollow-stem auger Date completed June 13, 1990

None " casing set to _____ ' None " screen set from _____ ' to _____ '

20' & 10' ft. of 12" SSWW screen recommended from 63' to 83' & 88' to 98'
Top .025"

Recommended screen slot size: Tubular well Not Recommended Gravel Pack well Bottom .060"

Water analysis Iron _____ PPM. hardness _____ GPG, PH _____

Site Geologist Joel A. Annable

Job No. 8569 Driller Craig Nielsen



NORTHERN COMPANY

INCORPORATED

INDIANAPOLIS • MISHAWAKA • LANSING

10

MEN00246

☐ TEST☒ PERMANENT

Job No. 16455

WELL LOG No. 4 CITY Otsego County AlleganOwner City of Otsego Township OtsegoSection 23 T1N, R12W

Location

State MichiganFrom Land Description 800' East of Hwy 89, 500' East of City Limits, 200' SW ofFrom Street or Road Kal River (300' NE of Well #3)

FORMATION FOUND - DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Stone Water Level
Fill	0	14	14	
Fine Sand	14	20	6	12
Coarse Sand	20	31	11	12
Boulders & Gravel	31	46	15	12
Silty Sand	46	50	4	
Coarse Sand	50	84	34	12
Fine Sand	84	86	2	12
Coarse Sand & Gravel	86	90	4	12
Fine Sand	90	97	7	12
Coarse Sand	97	107	10	12
Coarse Sand - Gravel	107	120	13	12
Clay	120	121		

Hole 30" "Dia Drilled by: { Cable Tool _____ Rotary _____ Jetting _____
 Reverse Circ. X Bucket _____ Auger _____

Rotary Hole Grouted: Neat Cement X Drilling Mud Same as Above Other None

Casing 30 "OD From 1 "above ground to 87 feet below ground. Weight 79.5 Pounds per foot

Screen 12" "Set from 95 to 120' feet Make Johnson Type W Slot .035

Pumping test 1200 GPM drawdown to 52 feet after 8 hours pumping 3550

SUBMERGED COMBUSTION EVAPORATORS

DOCUMENT #15

PAPERBOARD DIVISION OTSEGO, MICHIGAN • 616 • 692-6141 September 12, 1968

Air Pollution Control Section
Division of Occupational Health
Michigan Department of Public Health
3500 North Logan Street
Lansing, Michigan 48914

Gentlemen:

Please find attached our application for the installation and use of one (1) Selas Subcomco Transchanger Evaporator. This evaporator is to be used to concentrate spent sulfite liquor. It is being installed to prevent the release of spent liquor to the Kalamazoo River and thus eliminating a water pollution problem.

We have operated the same type of evaporator since 1962 with no noticeable air pollution problem. However, to be certain the emission of the present evaporator conformed to state standards, a stack survey was made. The results of this survey are attached as evidence that the new evaporator will meet emission requirements.

Very truly yours,

MENASHA CORPORATION

K. E. Lowe
Technical Manager
km

Enclosures

MENASHA CORPORATION
PAPERBOARD DIVISION
OTSEGO, MICHIGAN

APPLICATION TO THE AIR POLLUTION CONTROL COMMISSION

APPENDIX I

1. EQUIPMENT LOCATION DRAWINGS

See Drawing D-10-67.

2. EQUIPMENT SPECIFICATION

Make: One (1) Selas Subcomco Transchanger Evaporator
Model: No Model Number, Reference Name Plate No. 110063
Size: 12,000,000 Btu/hr. or 12,000 cubic feet Natural
Gas/hr.
Type: Gas Fired Submerged Combustion Evaporator

3. PROCESS OR USE SPECIFICATION

See Appendix 2.

4. OPERATING SCHEDULE

Days/year 340
Hours/day 24

The unit will normally be down during the first 10 days of
July each year and Christmas week.

5. PROCESS WEIGHT

Type: 20% Solids Spent Sulfite Liquor

Feed Rate: 13,000 lbs/hour (12,000 lbs/hour for present evaporator)

6. FUELS OR FIRING DEVICE

Type: Natural Gas
Rate: 12,000 cubic feet/hour
Btu: 950/1000 cubic feet of gas

Firing Device:

Make: (1) Gas Burner Selas No. 2
(1) Gas Burner Selas No. 1
Model: Selas No. 2 and Selas No. 1
Size: Selas No. 2 - 2,000 CFH
Selas No. 1 - 10,000 CFH

7. FLOW DIAGRAM

See Drawing

C-11-44

MENASHA CORPORATION
PAPERBOARD DIVISION
OTSEGO, MICHIGAN

Page 2

MEN00250

8. DRAWING OR EQUIPMENT

- a. See drawing SK-12568D for equipment details.
- b. See drawing D-11-40 for stack-separator equipment.
- c. Horsepower Rates .
Blower:
Liquor Pump:
- d. Testing Source:
See Drawing 3-M.

MENASHA CORPORATION
PAPERBOARD DIVISION
OTSEGO, MICHIGAN

APPENDIX 2

PROCESS OR USE SPECIFICATION

1. GENERAL

The Selas Subcomco Transchanger Evaporator is a gas fired horizontal Submerged Combustion Evaporator. The evaporator is used to concentrate spent sulfite liquor of 20% solids to a concentrated liquor of 45-50% solids.

2. PROCESS MATERIAL DESCRIPTION: SPENT SULFITE LIQUOR is the liquid waste resulting from the pulping (cooking) of hardwood species by the neutral sulfite semi-chemical pulping process. The liquor is primarily composed of sodium lignosulfonates, degraded sugars, and ash. A typical analysis is:

Solids, %	20
Btu	5700 (per lb. dry solids)
Na ₂ O, %	3.7 (exists as sodium carbonate, sulfite and sulfate)
Ash, %	7.2
S, %	1.0 (exists as sulfates and sulfites)

3. PROCESS DESCRIPTION

Approximately 20,000 gallons (40,000 gallons in 1969) of spent sulfite liquor is discharged from the pulp mill per day into a liquor holding lagoon. From the lagoon, the liquor is pumped to a 200,000 gallon storage tank. The liquor flows from the storage tank by gravity to the receiver tank of the evaporator. The receiver tank holds 1,400 gallons of liquor.

From the receiver tank the liquor is pumped by 600 GPM vertical-centrifugal pump to the feed nozzle (liquor feed nozzle) of the evaporator chamber. The liquor is sprayed on the gas flame from 12 - 1-1/2 inch diameter holes arranged evenly around the feed nozzle chamber. Water is flashed off (evaporated) when the liquor comes in contact with the flame. The liquor-water vapor mixture then flows to a liquid-gas separator. The gas-vapor mixture exits through the 48. foot (16-7/8" diameter) stack and the liquor flows to the receiver tank. Excess concentrated liquor overflows from the receiver tank to the holding lagoon. Liquor concentration is determined by the rate of liquor feed and recirculation rate.

MENASHA CORPORATION
PAPERBOARD DIVISION
OTSEGO, MICHIGAN

Page 2.

4. OPERATING CONDITIONS
(New Evaporator) (a)

Gas Rate: 12,000 CFH
Process Rate: 13,000 lb/hour
Feed Liquor Temp., ° F. 160
Circulate Liquor Temp., ° F. 220
Stack Temp., ° F. 185 - 190
Stack Pressure, in. Water 0.50
Blower Capacity, SCFH 120,000
Liquor Recirculation Rate, GPM 600

Process Rate:
Liquor In, lb/hour 13,000
Solids 20%
Liquor Out, lb./hour 4,700
Solids 55%
Evaporation Rate, lb/hour 8,300

(a) Design Data

5. FLUE GAS ANALYSIS

To determine the nature of the emissions from the evaporator a stack survey was made on the existing evaporator, which was installed in 1962 and is a duplicate of the new evaporator except for gas capacity. The gas capacity of the old evaporator is 10,000 CFH.

Since this was a "wet" stack, gas impingers were used to collect the emission from the stack and to trap the water. A diagram of the collection equipment used is attached in Drawing 3-M. The results of the gas velocity measurements and two stack determinations are included in Appendix 3.

These data are summarized below:

Average Stack Volume, CFM (stack conditions)	4,566
Average Total Weight Emissions, grams	0.204
Average Sample Volume, Cubic Feet (stack conditions)	20.9
Emission Rate, lb/hour	6.3
lb/day	150

Based on the data published in ACT 348 of 1965, the allowable emission rate for a process rate of 12,000 lb/hour is 13.6 lb/hour. Thus, the emission rate from the present evaporator is within the allowable rates. Since the design of the new evaporator is

MENASHA CORPORATION
PAPERBOARD DIVISION
OTSEGO, MICHIGAN

Page 3.

MEN00253

the same as the old evaporator, the emission rate of the new evaporator should meet the requirements of Act 348 of 1965.

The nature of the emissions from the evaporator stacks are mainly composed of liquor carryover, which is water soluble. About 36% of the emissions collected in the impingers were insoluble. This has been identified as a fly ash-like material. The suspended solids obtained were:

lb/hour	2.3
lb/day	55



GEORGE ROMNEY, Governor
R. GERALD RICE, M.D., Director

STATE OF MICHIGAN
DEPARTMENT OF PUBLIC HEALTH

3500 N. LOGAN, LANSING, MICHIGAN 48914

September 24, 1968

Menasha Corporation
Paperboard Division
P. O. Box 155
Otsego, Michigan 49078

Attention: Mr. Joseph Cutro, General Manager

Gentlemen:

Enclosed please find our approved permit for the installation of the proposed Selas Subcomcu Transchanger Evaporator as described and specified for the concentration of spent sulfate liquor wastes.

The test result information provided does indicate no undue emission of particulate material from this system. Final approval to operate the system will of course be based on evaluation of actual performance following completion of the installation and subsequent start-up of on-line operation.

Evaluation will include determination of nuisance odor or gases as well as particulate material emission. Please advise us upon completion and start-up of the system. If you have any further questions, please call on me. Thank you for your cooperation.

Very truly yours,

DIVISION OF OCCUPATIONAL HEALTH

Charl G. Oviatt, Engineer
Air Pollution Control Section

CGO:jap
Enclosure

Pulp mill 'shrinks' liquor disposal chore

Low cost, horizontal evaporator boasts 82% thermal efficiency, reduces product to 50% solids. Slash in volume permits year-around storage, simplifies disposal during warm months

K. E. LOWE, Technical Manager
J. CUTRO, General Manager
and E. R. TIMLOWSKI, Technical Supervisor
Menasha Corporation, Otsego, Michigan

CP Staff

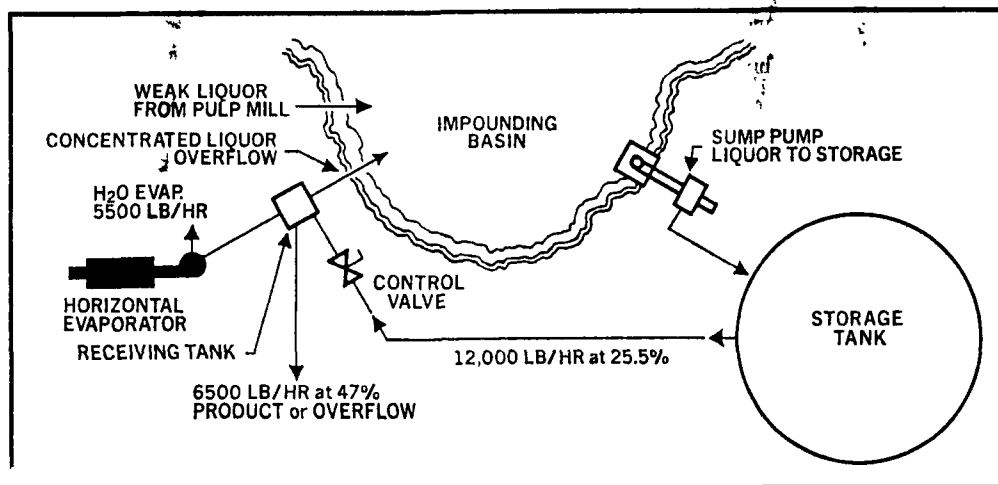
Air pollution control needs met too

STACK EMISSIONS from the horizontal evaporator's liquid-gas separator section are reported to fall well within the State of Michigan's standards. For a process feed flow of 12,000 lb/hr, the permissible rate is 13.6 lb/hr. The actual measured flow from the stack is only 6.3 lb/hr.

SHORTLY AFTER STARTUP, at a low liquor feed-rate, some carryover of burned particles was noticed in the area surrounding the evaporator. However,

installation of a high-volume liquor feed pump essentially eliminated this.

A STACK SURVEY was made shortly thereafter. Since this was a "wet" stack, typical "dry" stack sampling procedures could not be applied. Therefore, a train of gas impingers was used to absorb the emission in water. Approximately 70% of the emissions were composed of liquor carryover, while 30% were identified as flyash-like particles.



A 2.5 TO 1 REDUCTION in sulfite liquor volume is being achieved by evaporator serving this storage system at Menasha's pulp and paper mill in Otsego, Michigan

NEW SOLUTIONS OF PLANT PROBLEMS

Problem: An efficient and economical method of reducing 20,000 gpd of 18% solids spent neutral sulfite liquor to 6700 gal was needed at the Otsego, Michigan pulp and paper mill of the Menasha Corporation. Trimming the volume would permit the liquor to be impounded year-around in an existing 2.5 million-gal storage basin.

During warm months, the concentrated solids-waste product can be applied to local unpaved roads as a binder. Up to 2.5 million gal is used from late April to early October.

Concentrating the spent liquor to the manageable 6700-gpd volume meant removing 13,300 gpd of water. Multiple-effect evaporators were considered for the task. They were ruled out. Reasons: High initial investment costs and the mill's limited steam capacity.

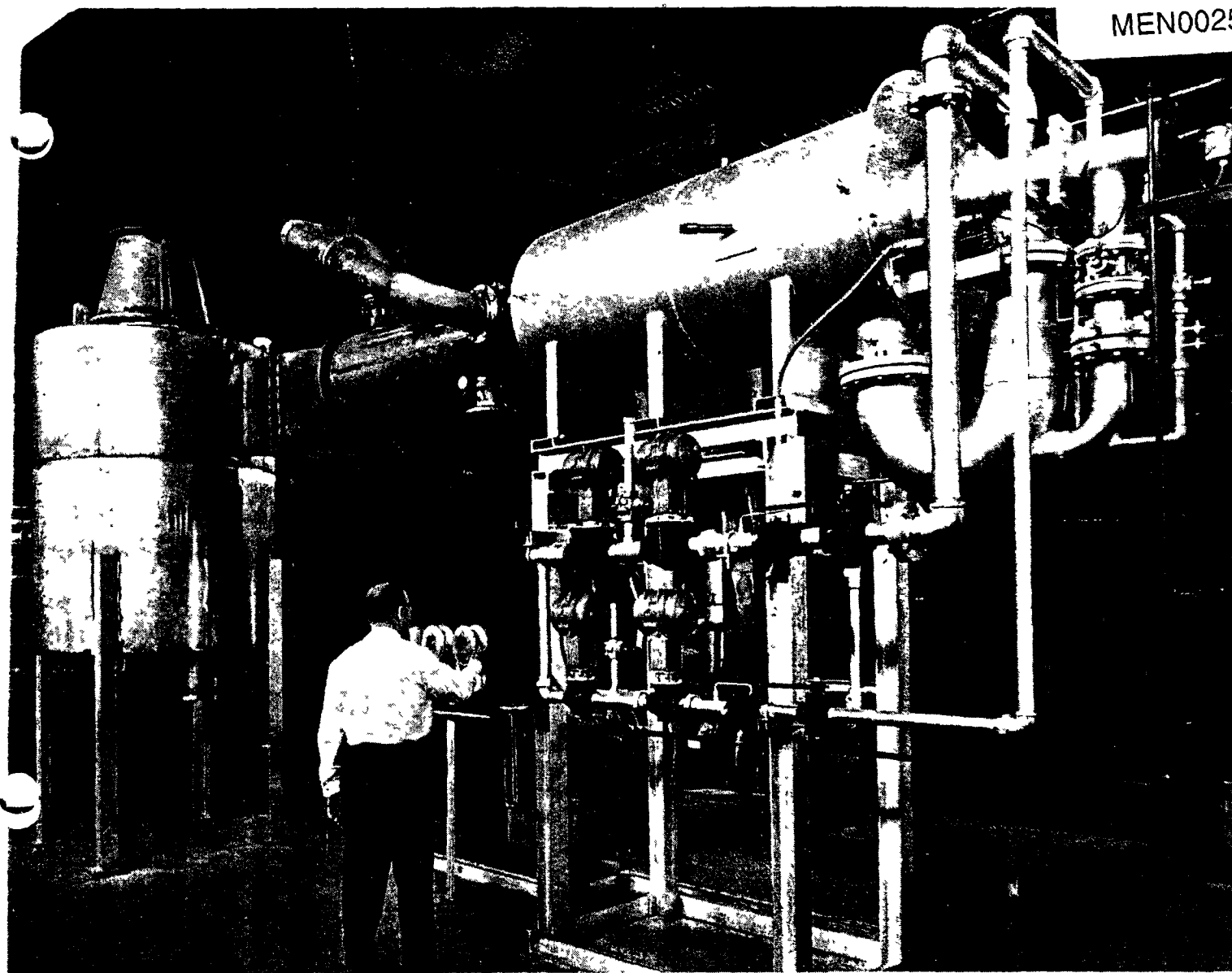
Solution: Based on previous successful experience with a similar unit, a specially developed, modified submerged-combustion evaporator was installed in early 1968. Known as a Transchanger concentrator-evaporator, a unique feature is the unit's horizontal design (see photo). In it, there are no heat transfer surfaces to become clogged or charred, thereby ensuring maximum thermal efficiency.

Major components include dual (2000 and 8000 cfh) natural-gas burners; brick-lined, steel-jacketed combustion chamber (10 million Btu/hr rating); rotary positive-displacement blower (100,000 cfh) jacketed stainless-steel feed chamber; double-walled preheater and cooling jacket; liquid-gas separator with stack and a stainless 1400-gal receiving tank.

The process, as conducted at Menasha is as follows: Weak liquor (about 25% solids) from the impounding basin is pumped to a 200,000-gal storage tank. From here, it is fed by gravity to the evaporator's 1400-gal receiving tank. Flow is about 12,000 lb/hr. It is controlled by a butterfly valve just ahead of the tank.

The liquor is pumped at 440 gpm through a preheater and then at 100°F is injected into the evaporator's feed chamber. Here it is vaporized by hot gases coming from the combustion section. Moisture flashes off and the entire mixture moves into the liquid-gas separator almost instantly. Baffles remove the concentrated liquor from the water vapor, which passes up the stack. The stack is insulated to prevent condensation and refluxing actions.

The 220°F concentrated liquor is withdrawn from the bottom of the separator and returned to the 1400-gal receiving tank where it is again combined with the



NO CHARRING, BURNING OR SCALING of critical parts that can reduce heat transfer efficiency is reported with this compact, horizontal-design evaporator. Liquid-gas separator is at far left. Equipment such as this is concentrating 12,000 lb/hr of waste neutral sulfite liquor at the paper mill installation discussed in the accompanying article

weak liquor being fed into it. Optimum level is maintained in the tank via an overflow line leading back to the 2.5 million-gal storage basin. Draw off is possible too.

All surfaces of the evaporator coming into contact with the spent sulfite liquor are made of type 316 stainless steel. The high injection rate (440 gpm) through the feed-chamber nozzles minimizes combustion and charring of organic materials in the liquor. Consequently, the Btu value of solids in the liquor is essentially the same as for those in dilute material.

Results: The spent sulfite liquor can now be impounded on a year-around basis at the mill, simplifying disposal during the warm months. The evaporator concentrates the liquor efficiently and economically. Reduction in volume under normal operating conditions is 25 to 1. Water

evaporation rate is about 5500 lb/hr, or 15,840 gpd, which is well above the 13,300 gpd sought originally.

Solids content of the concentrated liquor is controlled between 45-50% — although 55% can be obtained, if needed. Thermal efficiency of the evaporator is approximately 82%. This accounts for the energy needed to heat the liquor, the combustion air, and to evaporate 5500 lb/hr water.

Fuel costs average \$92 to \$120/day. With a fuel consumption rate of 8500 cfh, this calculates to about \$0.46 per ton of paper produced at the mill. There are no direct operating manpower requirements.

The direct cost of evaporating 1000 lb of water is \$0.69. This may appear to be somewhat high. However, from an investment standpoint, costs on a per ton basis are considered to be reasonable.

The total operating and investment costs per ton of paper are \$0.65, based on producing 200 tpd for a 350-day operating year. The initial installed investment for the equipment was about \$65,000 — or approximately only one-third the price of

Transchanger concentrator-evaporator — In relieving their spent sulfite liquor storage problem, Menasha Corporation installed an evaporator manufactured by this compact, Selas Corporation of America, Dresher, Pa. 19025. Circle 192 opposite last page.

conventional evaporation or drying equipment of equivalent capacity. The capital outlay is being charged off over a 10-yr period. Maintenance expenditures average about \$3000 yr.



MENASHA CORPORATION

September 20, 1985

Cal Peters
Department of Natural Resources
621 10th St.
Plainwell, MI 49080

Dear Cal:

The permit for construction and operation of our Selas Subcomco Transchanger Evaporator can be voided. This permit was issued to Menasha Corporation on September 19, 1968. The installation of new equipment allowed us to completely and permanently remove this evaporator from the plant premises. If you have any additional questions, please contact the writer.

Sincerely,

Menasha Corporation

John R. Blauwkamp, P.E.
Corporate Environmental Manager

kj

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION

THOMAS J. ANDERSON
 RLENE J. FLUHARTY
 EPHEN V. MONSMA
 U STEWART MYERS
 DAVID D. OLSON
 RAYMOND POUPORE
 HARRY H. WHITELEY



JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING
 BOX 30028
 LANSING, MI 48909

RONALD O. SKOOG, Director

NOV 6 1985

Mr. John R. Blauwkamp, P.E.
 Corporate Environmental Manager
 Menasha Corporation
 Farmer Street
 Otsego, Michigan 49078

Dear Mr. Blauwkamp:

This letter is in reference to your Permit to Install issued on September 19, 1968, for a Selas Subcomco Transchanger Evaporator, located at Farmer Street, Otsego, Michigan.

This permit, identified as No. 204-68, has been voided per your letter dated September 20, 1985.

Please contact me if you have any questions concerning this action.

Sincerely,

Dhruman Shah, Engineer
 Northwest Permit Unit
 Air Quality Division
 517-322-1333

DS:jmc
 Enclosure
 cc: Dick VandeBunt

AIR POLLUTION CONTROL SECTION
DIVISION OF OCCUPATIONAL HEALTH
MICHIGAN DEPARTMENT OF PUBLIC HEALTH
3500 North Logan Street, Lansing, Michigan 48914

MEN00259

APPLICATION NO
204-68

APPLICATION TO THE AIR POLLUTION CONTROL COMMISSION

for authority to construct, install or alter

and

for permit to operate process, fuel burning, refuse burning and/or air pollution control equipment

1. PERMIT TO BE ISSUED TO: (Business License Name of Corporation, Partnership, Individual Owner, Governmental Agency)

MENASHA CORPORATION, PAPERBOARD DIVISION

2. MAILING ADDRESS: (Number, Street, City or Village, Zip Code)

P.O. Box 155, Otsego, Michigan 49078

3. EQUIPMENT OR PROCESS LOCATION: (Number, Street, City or Village, Township, Zip Code)

Same

4. TYPE OF ORGANIZATION:



Corporation



Partnership



Individual Owner



Governmental Agency

5. GENERAL NATURE OF BUSINESS:

Paperboard Manufacturing

6. EQUIPMENT DESCRIPTION: Application is hereby made for permission to construct, install or alter and to operate the following equipment

A Selas Subconco Transchanger Evaporator. This is a gas fired submerged combustion evaporator for concentrating spent sulfite liquor from 20% solids to 40-50% solids. The fuel rate is 12,000 cubic feet of natural gas per hour and the process feed rate is 13,000 lb/hour. The unit is being installed to reduce the volume of spent liquor so that it can be impounded instead of released to the Kalamazoo River. Thus, eliminating a water pollution problem.

7. ESTIMATED COST: Air Pollution Control Equipment \$ **1,000.00** Total Project \$ **65,000.00**

8. PRESENT STATUS OF EQUIPMENT: (Check and complete applicable items)

	Estimated Starting Date	Estimated Completion Date
() Construction or installation not started	9/1/68	11/1/68
() Construction or installation partly completed . . .		
() Construction completed		
() Equipment is to be altered		
() Equipment is partly altered		
() Equipment has been altered		
() Change of location and/or ownership		

9. NAME OF PRIOR OWNER AS IN (1) ABOVE, AND PRIOR AIR POLLUTION CONTROL PERMIT NUMBER, IF ANY:

(Name) **None**

(Permit Number) **None**

10. TYPE OR PRINT NAME AND TITLE OF OWNER OR AUTHORIZED MEMBER OF FIRM:

(Name) **Mr. Joseph Cutro**

(Title) **General Manager**

(Signature) *Joseph Cutro*

(Date) **9-4-68**

(Phone No.) **692-6141**

11. DISPOSITION OF APPLICATION:

Permit to install approved and issued on **SEP 19 1968**

Permit to operate approved and issued on

VOID
NOV 6 1968
Signature: *Edward D. Bloomfield*
Signature: *Robert M. Miller*

MUPH
USE ONLY

NK PITCH TESTS

DOCUMENT #16



President's E Star Award for Exports

Buckman Laboratories, Inc.

BUCKMAN LABORATORIES INTERNATIONAL, INC

AUSTRALIA	CANADA	SOUTH AFRICA
BELGIUM	JAPAN	U S A Memphis Tenn
BRAZIL	MEXICO	U S A Cadet Missouri

1256 NO McLEAN BLVD / P O BOX 8305 / MEMPHIS, TN 38108, U S A / TELEPHONE (901) 278-0330 / TELEX 6828020 534587 / CABLE ADDRESS BULAB

July 13, 1987

Mr. Gary Roys
Menasha Corporation
320 N. Farmer St.
Otsego, MI 49078

Dear Mr. Roys:

You recently gave us the opportunity to demonstrate our new N-K pitch test in your mill. This test is a qualitative/quantitative method of evaluating the level of extraneous material on paper machines and associated systems. The results are enclosed for your review.

The test conducted 5-20-87 compared contamination levels as fiber travels through your cleaning system. Also conducted was a comparison of the effect of different dispersants on washing virgin pulp from the Defibrator screen. The results indicate that use of a dispersant at this point, particularly Busperse 251, would substantially improve the washing process and resulting pulp quality.

During our evaluations, we found the N-K pitch test quite reliable in evaluating the effectiveness of a cleaning mode, and as such could be used to evaluate both chemical and mechanical cleaning trials.

The Krofta and DSM screens, handling secondary fiber cleaning rejects, were evaluated on June 3.

The enclosed results indicate the DSM was considerably more effective at removing materials from the water than the Krofta. However, the efficiency of the Krofta could be dramatically improved by the addition of Bufloc A2. Bufloc A2 is a very high molecular weight anionic polymer, which would aid in flocculation of solids, allowing more effective removal in these apparatuses.

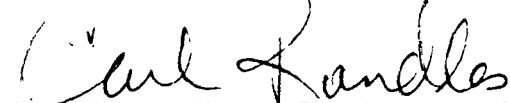
Using the N-K pitch test, a trial could be conducted and evaluated, all in the same day, the same as our original comparison to the DSM screen.

Letter to Mr. Gary Roys
Menasha Corporation

If you have any further questions or comments, please feel free to contact me.

Regards,

BUCKMAN LABORATORIES, INC.



Carl A. Randles, III, District Manager

trs

Attachments

cc: Mr. John Bonham
Mr. Mark Reed

Menasha Corporation
N-K Pitch Test Results

To: Gary Roys

Date: June 15, 1987

5/20/87

Defibrator

ContPulp: Grams of Material/BottleBsp 47Bsp 59L0Bsp 251

WT. .0807

.0510

.0605

.0219

GR.

CLEANING EFFICIENCY:

Recycle Feed TopRecycle
ThickeningVirgin DEFVirgin DKP

WT. .0770

.0169

.382

.346

GR.

6/3/87

RECYCLED FIBER CLEANER REJECTS

FeedKrofta AccD S M Acc

WT .1530

.1222

.0494

A

Gr. .1095

.1151

.0735

B

PESTICIDE TESTING

DOCUMENT #17



TO: Mark Reed

DATE: November 18, 1985

SUBJECT: Waste Paper - Pesticide Analysis

FROM: Gary Roys

Attached find the results of testing done on waste paper that was received from a box plant. These boxes were intended to be used for packing of pesticides, particularly, defolatan and paraquat. The paper was analyzed for each and none was found to be present.

cc: B. Buchanan
M. Carlson
J. Blauwkamp
J. Porter

kj

MORSE LABORATORIES, INC.

CHEMICAL ANALYSIS AND RESEARCH

1525 FULTON AVENUE
SACRAMENTO, CALIFORNIA 95825
(916) 481-3141

November 14, 1985

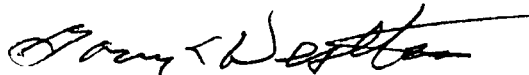
Menasha Corporation
P. O. Box 155
Otsego, Michigan 49078

Laboratory No. 36379
Date Received 9/27/85
Sample 1 Sample Paper/cardboard for Paraquat and Difolatan
(P.O. #488504)

Difolatan	None detected
Paraquat	None detected

Detection limits;
Difolatan = 0.1 ppm
Paraquat = 0.05 ppm

MORSE LABORATORIES, INC.


Gary L. Westberg
Director

GLW:db

WAX TESTS

DOCUMENT #18

WAX ANALYSIS:

BASE LINE ANALYSIS - AUGUST 1994

<u>SAMPLE</u>	<u>WAX:ppm</u>	<u>SAMPLE</u>
MEDIUM - REEL1863:8/22	490	KRAFT H.D. - 8/22
MEDIUM - REEL1898:8/23	540	KRAFT H.D. - 8/23
MEDIUM - REEL1927:8/24	440	KRAFT H.D. - 8/24
MEDIUM - REEL1961:8/25	480	KRAFT H.D. - 8/25
MEDIUM - REEL1995:8/26	600	KRAFT H.D. - 8/26

<u>WAX:ppm</u>
587
436
456
480
538

COLD PULPING TRIAL SEPT. 1994

<u>SAMPLE</u>	<u>WAX:ppm</u>	<u>SAMPLE</u>
MEDIUM - REEL2301:9/6STARTUP	730	KRAFT H.D. - 9/6:345am
MEDIUM - REEL2302:9/6: @	1400	KRAFT H.D. - 9/6:400am
MEDIUM - REEL2303:9/7: @	1500	KRAFT H.D. - 9/7:1145am
MEDIUM - REEL2304:9/7: @	1600	KRAFT H.D. - 9/7:100pm
MEDIUM - REEL2305:9/7: @	1100	KRAFT H.D. - 9/7:530pm
MEDIUM - REEL2311:9/8	770	KRAFT H.D. - 9/8:1015am
MEDIUM - REEL2330:9/9	1100	KRAFT H.D. - 9/9:645am
MEDIUM - REEL2427:9/12	610	KRAFT H.D. - 9/12
MEDIUM - REEL2460:9/13	680	KRAFT H.D. - 9/13
MEDIUM - REEL2489:9/14	580	KRAFT H.D. - 9/14

<u>WAX:ppm</u>	<u>pH</u>	<u>TEMP</u>
1235	7.2	78
1592	7.2	80
1617	7.2	96
4565	7.4	100
3200	7.4	106
1370	7.6	120
<50	7.3	135
3913	7.0	142
1851	6.8	138
1415	6.9	136

@: 100% RECOR

MEN00268

BACTERIAL ANALYSIS

DOCUMENT #19

PAUL JACHIM

MEN00270

BUCKMAN LABORATORIES, INC.

Memphis, Tennessee

SERVICE REPORT

To: John Henry

Date: May 5, 1992

John:

Gary Roys and I took samples from both the No. 1 and No. 2 paper machines today to perform the TAPPI T449 microbiological test. Reel numbers 5459 and 8899 were disintegrated and diluted to 1/1000 prior to plating with nutrient agar. Aerobic petri film was also plated to give us a colony or spore comparison. The samples will be taken to my home and incubated for 48 hours. After that time, I will count the number of colonies and relay the data to you and your colleagues. As you know, last week the petri dish counts were too numerous to count. Therefore, we diluted the samples to 1/1000 (last samples were plated at 1/100). However, the aerobic petri film displayed a count of 61,000 colonies (spores) per milliliter of water. This gives us a ball park value of:

61,000 colonies/ml sample X 495 ml water/5.0 gms finished product]=

6,039,000 colonies/gram

This of course was only an estimate and is the highest value you would see since you were down several hours prior to testing. In addition, you were running 100% kraft furnish.

Both white water systems for the No.1 and No.2 paper machines were tested today for fecal coliform bacterium. The test involves spreading 0.10 ml of sample across the surface of Eosin methylene blue agar. The cultures are then incubated at average machine temperatures for 48 hours and counted. The fecal coliforms highly unlikely to be found in your system. I will let you know if there are any traces of these organisms.

All materials necessary for testing microorganisms both in the white water and the final product are stocked in your laboratory. Therefore, routine testing will be easier.

A sample was taken today from the number 9 well for analysis of calcium, alkalinity, total hardness, etc. Continuous sampling of this water source will give us some type of idea of what we can expect on a day-to-day basis.

The test results of the scale sample from the No.1 vacuum pump are back and are enclosed. Looking at the percentages we see approximately 15% organic matter (fiber, pitch, additives, etc.) and 85% inorganic (earth and transition metals). The largest inorganic

component is silicon. Which is most likely coming from sand. However, the appearance of the scale does not appear to contain crystalline silicon or sand. As you requested, a scan of sodium on Buckman's Inductively Coupled Plasma instrument will give us the sodium contribution in parts per million. This will tell us if sand

is the culprit. If sand is not the problem then we may need to look at other sources such as, process chemical additives. As you know, many compounds react differently when exposed to high temperatures 140+ Fahrenheit. I will report the sodium data as soon as it is available.

Your current open chemical bin and unopened chemical inventories are

PRODUCT NAME	APPLICATION POINT	SIGHT GLASS (inches)	FEED RATE (ml/min)
Busperse 231	No.1 PM vacuum pumps	16.5	25
Busperse 231	No.2 PM vacuum pumps	39.5	17
Busperse 47	Recycle loop to reactor	39.75	55

Note: Each are fed continuously.

UNOPENED

Busp. 49 - 4 drums, Busp, 229 - 1 drum, Busp. 47 - 2 tote bins

John, if you or any of your colleagues have any questions or comments about today's service report, please feel free to contact me at:

Home:	219-436-6447
Voice Mail:	800-937-7556
Beeper:	800-999-6710
I.D.#	999-5972
Car:	219-433-6939

Sincerely,

BUCKMAN LABORATORIES, INC.

Donald J. Comparoni
District Representative

cc: Tom Oldham
Jack Bray
Paul Jachim
Steve Morse
Al Coleman

MEN00272

Keith Kling
Jay Thiessen
Dave Merkel
Gary Roys

Reported By: TM:DJC

Date: 04-29-92

Company and Location: MENASHA CORP., OTSEGO, MI

Reference: RLW DATED 04-27-92

Control No: 012380

Sample Received: 04-28-92

Identification of Sample(s): VACUUM PUMP SCALE IN SEAL WATER AREA

Statement of Problem: #1 VACUUM PUMP FOR #1 PM BECAME INOPERABLE

Work Requested: INORGANIC ANALYSIS

Report on Work Done:

Inorganic:

The above sample was dried and ashed; consequently, the elements were converted to the oxide form. ICP analysis of the ash indicated the presence of the following:

Ash Content (@875 $\frac{1}{2}$ C)	84.7%
Phosphorous (as P12O15)	LT 2.3%
Sulfur (as SO13)	1.5%
Zinc (as ZnO)	LT 0.2%
Barium (as BaO)	LT 0.2%
Iron (as Fe12O13)	LT 0.2%
Silicon (as SiO12)	87.6%
Manganese (as MnO12)	LT 0.2%
Magnesium (as MgO)	3.3%
Aluminum (as Al12O13)	2.0%
Calcium (as CaO)	5.3%
Copper (as CuO)	LT 0.2%
Titanium (as TiO12)	LT 0.2%

LT = less than

Carbonate spot test was positive.

Analysis of the scale by FTIR did not reveal peaks expected from oxalate.

This is a rough copy! A formal report is being put together.

Memo

MEN00274

MENASHA CORPORATION

TO: Jim Porter
FROM: Paul Jachim
DATE: May 12, 1992
SUBJECT: Biological Testing of Otsego Medium

=====

On Tuesday, May 5, a Buckman chemical representative was in to test our medium for bacteria content. Results of that testing showed 33,200 colonies per gram for #1PM and 43,800 colonies per gram on #2PM. Both samples were taken using the TAPPI Procedure 449 with the machines running our normal mixture of recycle and virgin wood furnish. Tests for fecal coliform bacteria showed negative.

This testing procedure will be repeated to develop a feel for repeatability. Extensive efforts to try to determine if an FDA standard for bacteria counts for liner and medium continue to yield negative results. The only standard that we have been able to determine exists is for "milk containing materials". That standard is 250 colonies per gram.

Our direction for this effort will include retesting, gathering data on #1PM during a 100% recycle run, and finally obtaining a proposal from Buckman for biocide treatment to the milk carton standard for the purposes of our evaluation. It is not my intent at this point to treat our system with biocide.

cc: Keith Kling
David Merkel
John Henry
Gary Roys

PJ:amc

6,000,000

6.202

1 plane

classifying

monthly test

FPA

DEPOSIT CHEMICAL ANALYSIS

DOCUMENT #20



NALCO CHEMICAL COMPANY

ONE NALCO CENTER • NAPERVILLE, ILLINOIS 60563-1198 • AREA 708-305-1000

Menasha Corporation
320 N. Farmer St.
P.O. Box 155
Otsego, MI 49078

4-24-93

Attention: Mr. John Henry

Subject: Cleaner deposit analysis

Dear John:

During the last down you gave me two deposit samples which were removed from the secondary cleaner system. These samples were analyzed with respect to their chemical makeup and components.

Sample #1

The first sample was described as a sooth light tan color deposit. It was hard and brittle. It was reported to come from the top of a cleaner cone. This deposit shows to be primarily composed of calcium carbonate 82%. With some iron and organic components. Calcium Oxalate was also present.

Nalco recommends either an acid treatment or a caustic boilout using 8651. You should ask your cleaner supplier for his recommendations concerning cleaning of carbonate scale.

Sample #2

The second sample is described as containing both hard and soft deposits in a fibrous sticky brown mass. This deposit was thought to be caused from the above mentioned deposit after it broke away from the cleaner. This however is not the case. Deposit #2 contained less than 2% calcium carbonate with 12% organic. The bulk of the deposit contained a mix of components including.

- * Coal
- * Silicon Oxide (sand or rock)
- * Ethylene vinyl acetate
- * Polyethylene
- * Styrene-butadiene rubber, other styrene rubbers
- * Polyisoprene

(1)

As we suspected, the one was a plastic like substance,

CC: Tom Oldham
FYI. From the deposits
from the Cellico cleaners.
6-7-93 David

Many of these components exist as individual units. I am returning part of the sample with this report. The sample was cleaned of most organic components. These deposits are simply coming through your pre cleaner system. The size of the deposit is what is plugging the cleaner.

Thank you for allowing Nalco to serve you.

Sincerely,


Fred J. Kalakay

Not sure how we can clean the
plastic-based samples out. Is this
still a problem or are we replacing
all of the cleaners?

Dan

TOLUENE EXTRACTIONS

DOCUMENT #21

1/13/89 - taken from HH to Sample 1
 Heaton, the first - Toluene extraction
 on Knight HD & Hydrazine Leopold
 Sample taken 1/12/89. The Hydrazine
 sample was over dried. The HD Knight sample
 was air dried overnight. Toluene has 10001% residual

Knight H.D. Sample
 108.6723
 104.1396
 4.5327
 4.3442g of stock
 0.105g ext/gum - 21.155 extractable / gm stock

① w/air
 101.4707
 101.4250
 10457g normal w/ Toluene

1.05% organic extractable

Hydrazine Leopold

① 96.5850
 96.5024
 10824g

Toluene 50cc
 152.4300 102.7225
 102.2256 102.2252
 50.2244 102.2252
 50.2244 102.2252
 1.688.2742
 1.549
 10139

34.0507
 33.9863
 0644
 96cc sample
 96cc Toluene

975 gram/gallon
 59.2 # extract / gm

Aug 1.118 gram/gallon of organic extractable

1/18/89
 Secondary Fiber - Toluene extraction
 Sampled Fiber 1/18/89 - HAgung to Suge Pit
 Krist HD Consistency Since 1/12/89

① 134.0	6.05	3.96%
230	2.1	
111.0 wet wt	4.4	

AUC 2.86%

② 128.4	6.05	3.75%
230	2.1	
105.4	3.95	

	Sample wt	Masterland Sample
96.5449	111.3267	98.4579 98.2274 93.92%
96.5116	103.6688	95.4867 95.4867 54.105%
10553 gr of residual	7.6579 g residual sample	2.9712 2.7907 6.07%
	7.1931 g sample	

$\frac{10553 \text{ g ext}}{7.1193 \text{ g of fiber}} = \frac{15.38 \text{ LB ext}}{\text{ton fiber}}$ or 2.44 LB/1000 gal

hydraduracc Accepts Fiber 200cc - 103.9274

Total orals	Sup ② 5cc
185.9115 96.8396 1.46%	1.1659 1.278%
96.4098 96.4098	1.1520
29.5017 .4298	1.0139

94.8967
 94.8537
 10430 g of residual 10430 g of organic extractive / 2.86 g TS
 101503 g / g TS or

30.6 LBS extractives / ton Solid

or
 $\frac{200 \text{ cc}}{1000215 \text{ g/cc}} = \frac{100179 \text{ LB/gal}}{1.79^* \text{ ext/1000 gal}}$

Toluene extraction of hydrazine acceptor and
 stock to Kraft HD

2/24/89

Kraft HD
 Concentration
 ① 117.8 4.16g
 230 4.32%
 94.8

③ 116.3 3.9g
 230 4.18%
 93.3

ADG
 4252

⑤ 109.5419
 1048409
 4.7010 wet stock
 4.4974 00 stock

⑤ 107.4680
 103.9291
 3.5389 wet stock
 3.3857 00 stock

Mixture of D and sample

103.7072 103.6081 95.67% S.A.
 101.4248 101.4248 4.33% moist
 2.2822 2.1833

Hydrazine acceptor

① Susp Solids 3cc
 1.1619 1.18%
 ② 1.1625 1.177%

1.1565
 1.0054
 1.1572
 1.0053

Total Solids 30cc
 131.7205 102.5402 108%
 102.2214 102.2214 57%

29.4991 3.18%

extractive 150cc

④ 94.8582 10047g EXT/1.594g solids
 5.9048 EXT/1.594g solids

94.8535
 10047

① 96.0732 10130g ext/1.594g solids
 16.31 LB EXT/1.594g solids
 96.0602

PHENOL TEST

DOCUMENT #22

259

April 2, 1980

Samples of Kraft stock intermediate chest and white water were filtered over a 4 day sample period. The filtrate was sent in for phenol

Analysis.

Kraft stock filtrate — KRI — Phenol 6760

White water — WWI — 8320

OK